AIR QUALITY PERMIT

Issued To:	International Malting Company, LLC Great Falls P.O. Box 712 Milwaukee, WI 53201	Permit: #3238-00 Application Complete: 03/03/03 Preliminary Determination Issued: 04/02/03 Department's Decision Issued: 05/01/03 Permit Final: 05/17/03 AFS: #013-0035

An air quality permit, with conditions, is hereby granted to International Malting Company, LLC – Great Falls (IMC), pursuant to Sections 75-2-204 and 211 of the Montana Code annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Permitted Equipment

IMC operates a barley malt manufacturing plant with a malt and salable malt by-product production capacity of 16 million bushels per year. Construction and operation of the proposed malting plant will occur in two phases (Phase I and Phase II). After construction of Phase I, the malting plant will have the capacity to produce from 8 to 12 million bushels of malt and salable malt by-product per year. After construction of Phase II, the malting plant capacity will increase to a maximum of 16 million bushels of malt and salable malt by-product per year. IMC will commence Phase II operations within 3 years of the commencement of Phase I operations. A complete list of equipment is contained in Section I.A of the permit analysis for this permit.

B. Plant Location

The IMC facility is located approximately 2 miles north of the City of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE¼ of the SE¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

SECTION II. Conditions and Limitations

A. Operational Requirements

1. Malt and salable malt by-product production shall be limited to 16,000,000 bushels during any rolling 12-month time period (ARM 17.8.749).

2. IMC shall not receive more than 456,000 tons of barley during any rolling 12-month time period (ARM 17.8.749).

3. IMC shall house all barley preparation processes within the headhouse and shall utilize fabric filter baghouse control for emissions from the barley preparation processes (ARM 17.8.752).

4. IMC shall unload all barley shipments to underground hoppers. IMC shall utilize fabric filter baghouse emission control on the hoppers (ARM 17.8.752).

5. IMC shall load all malt and salable malt by-product for shipment via covered conveyors. IMC shall utilize fabric filter baghouse emission control on the conveyors (ARM 17.8.752).

6. Each material transfer point for grain receiving and off-loading shall incorporate an enclosure (at least 3-sided) for fugitive emission control (ARM 17.8.752).

7. IMC shall not cause or authorize the production, handling, storage, or transportation of any material without taking reasonable precautions to control emissions of particulate matter (ARM 17.8.308).

8. IMC shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

9. IMC shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.8 (ARM 17.8.752).

10. Elemental sulfur burning for kiln operations shall be limited to 500 pounds of sulfur per kiln batch (ARM 17.8.749).

11. Total elemental sulfur burning for kiln operations (cumulative for all 3 kilns) shall be limited to 365,000 pounds during any rolling 12-month time period (ARM 17.8.749).

12. Total elemental sulfur burning for kiln operations (cumulative for all 3 kilns) shall not exceed 2190 hours during any rolling 12-month time period (ARM 17.8.749).

13. IMC shall burn only pipeline quality natural gas for the kiln operations process and booster heaters (ARM 17.8.752).

B. Emission Limitations

1. Particulate matter with an aerodynamic diameter of 10 µm or less (PM_{10}) emissions from each barley preparation baghouse (Baghouse #1 through Baghouse #8) shall be limited to 0.005 gr/dscf of air-flow (ARM 17.8.749).

2. Emissions from each of the 12 – 19.12 MMBtu/hr process heaters shall not exceed the following (ARM 17.8.749):

NOx	1.87 lb/hr
CO	1.57 lb/hr

3. Emissions from the 21 MMBtu/hr booster heater #1 shall not exceed the following (ARM 17.8.749):

NOx	2.06 lb/hr
CO	1.73 lb/hr

4. Emissions from the 38 MMBtu/hr booster heater #2 shall not exceed the following (ARM 17.8.749):

NOx	3.73 lb/hr
CO	3.13 lb/hr

5. SO_2 emissions from each kiln shall be limited to 83.33 lb/hr (ARM 17.8.749).

6. IMC shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6-consecutive minutes (ARM 17.8.304).

7. IMC shall not cause or authorize any fugitive emissions to be discharged into the outdoor atmosphere that exhibit an opacity of 20% or greater averaged over 6-consecutive minutes (ARM 17.8.308).

C. Testing Requirements

1. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of operations, IMC shall conduct performance source testing on Baghouse #1 through Baghouse #8 and verify compliance with the particulate and opacity limitations in Section II.B.1. After the initial source tests, additional source testing for Baghouses #1, #2, #3, and #6 (25,000 dry standard cubic feet per minute (dscfm) capacity) and Baghouses #5, #7, and #8 (35,000 dscfm capacity) shall be conducted on an every 2-year basis, or according to another source testing/monitoring schedule as may be approved by the Department of Environmental Quality (Department). Additional source testing for Baghouse #4 (10,000 dscfm capacity) shall be conducted on an every 5-year basis, or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and ARM 17.8.749).

2. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of the process heaters, IMC shall conduct performance source testing for NO_x and CO, concurrently, on the 12 – 19.12 MMBtu/hr process heaters and verify compliance with the emission limitations in Section II.B.2. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

3. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of booster heater #1, IMC shall conduct performance source testing for NO_x and CO, concurrently, on booster heater #1 to verify compliance with the emission limitations in Section II.B.3. After the initial source test, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

4. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of booster heater #2, IMC shall conduct performance source testing for NO_x and CO, concurrently, on booster heater #2 to verify compliance with the emission limitations in Section II.B.4. After the initial source test, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

5. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of operations, IMC shall conduct performance source testing on the kiln stacks and verify compliance with the SO_2 emission limit in Section II.B.5. The source test shall be conducted while sulfur is being burned in the batch process. After the initial source test, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

6. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

7. The Department may require further testing (ARM 17.8.105).

D. Operational Reporting Requirements

1. IMC shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. IMC shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745(1), that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit.

   The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by IMC as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

4. IMC shall document, by month, the total amount (in tons) of malt and salable malt by-product produced annually at the facility. By the 25th day of each month, IMC shall total the malt and salable malt by-product produced during the previous 12 months to verify compliance with the limitation in Section II.A.1. A written report of the compliance verification shall be submitted with the annual emission inventory (ARM 17.8.749).

5. IMC shall document, by month, the total amount (tons) of barley received annually by the facility. By the 25th day of each month, IMC shall total the amount (tons) of barley received during the previous 12 months to verify compliance with the limitation in Section II.A.2. A written report of the compliance verification shall be submitted with the annual emission inventory (ARM 17.8.749).

6. IMC shall document, per kiln batch, the total amount (pounds) of elemental sulfur burned. IMC shall maintain on-site records of the amount of sulfur burned per kiln batch to verify compliance with the limitation in Section II.A.10. A written report of the compliance verification shall be submitted with the annual emission inventory (ARM 17.8.749).

7. IMC shall document, by month, the total amount (pounds) of elemental sulfur burned for kiln operations. By the 25th day of each month, IMC shall total the amount (pounds) of elemental sulfur burned during the previous 12 months to verify compliance with the limitation in Section II.A.11. A written report of the compliance verification shall be submitted with the annual emission inventory (ARM 17.8.749).

8. IMC shall document, by month, the total hours of elemental sulfur burning for kiln operations. By the 25th day of each month, IMC shall total the hours of elemental sulfur burning during the previous 12 months to verify compliance with the limitation in Section II.A.12. A written report of the compliance verification shall be submitted with the annual emission inventory (ARM 17.8.749).

E. Notification

1. Within 30 days before or after commencement of construction of Phase I of the barley malt manufacturing plant operations, IMC shall notify the Department of the date of commencement of construction (ARM 17.8.749).

2. Within 15 days before or after actual startup of Phase I operations, IMC shall notify the Department of the date of actual startup (ARM 17.8.749).

3. Within 30 days before or after commencement of construction of Phase II of the barley malt manufacturing plant operations, IMC shall notify the Department of the date of commencement of construction (ARM 17.8.749).

4. Within 15 days before or after actual startup of Phase II operations, IMC shall notify the Department of the date of actual startup (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – IMC shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if IMC fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving IMC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by IMC may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis
International Malting Company, LLC – Great Falls
Permit #3238-00

I. Introduction/Process Description

A. Permitted Equipment

International Malting Company, LLC – Great Falls (IMC) operates a barley malt manufacturing plant with an initial Phase I malt and salable malt by-product production capacity of 10 million bushels per year and a final plant (after Phase II) capacity of 16 million bushels per year. The IMC plant incorporates the following equipment:

- 4 steeping vessels, each 20-meters in diameter
- 8 germinating vessels, each 31-meters in diameter
- 3 natural gas fired kilns incorporating 12 primary process heaters rated at 19.1 million British thermal units per hour (MMBtu/hr) heat input capacity per process heater and 2 natural gas fired booster process heaters rated at 21 MMBtu/hr and 38 MMBtu/hr heat input capacity, respectively
- A barley washer
- Eighty silos for storing barley and malt products
- 8 process fabric filter baghouses (Baghouse #1 through Baghouse #8)
- Associated equipment

The above list of equipment includes all proposed equipment for Phase I and Phase II operations.

B. Source Description

The IMC facility is located approximately 2 miles north of the City of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE¼ of the SE¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

Malt is the processed form of barley grain and the basic ingredient in the production of beer. Malting is the process by which barley is transformed into malt. The process begins with "steeping" or soaking of clean barley kernels in large tanks of water called "steeping vessels." After steeping, the barley is then removed from the steeping vessels and placed in a germinating vessel. After a period of germination, the barley is dried and roasted in a kiln to stop the germination process and reduce the moisture content of the product, now considered malt. At this stage of the process the malt product can be easily stored and/or shipped to various locations for further processing.

Construction and operation of the proposed malting plant will occur in 2 phases. After construction of Phase I, the malting plant will have the capacity to produce from 8 to 10 million bushels of malt per year. After construction of Phase II, the malting plant capacity will increase to a maximum of 16 million bushels of malt per year. IMC will commence Phase II operations within 3 years of the commencement of Phase I operations. The entire malting plant encompasses approximately 10 acres of land.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices), and shall conduct test, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   IMC shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.221 Ambient Air Quality Standard for Visibility
7. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

IMC must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, IMC shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR 60.

   40 CFR 60, Subpart DD, Standard of Performance for Grain Elevators. This subpart does not apply to the proposed facility because the facility does not meet or exceed the grain storage capacity of an affected source as defined in this subpart.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. IMC submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 When Permit Required--Exclusions. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a facility to obtain an air quality permit or permit alteration if they construct, alter or use any air contaminant sources that have the potential to emit greater than 25 tons per year of any pollutant. IMC has the potential to emit more than 25 tons per year of total particulate matter (PM), particulate matter with an aerodynamic diameter less than or equal to 10 µm (PM_{10}), sulfur dioxide (SO_2), oxides of nitrogen (NO_x), and carbon monoxide (CO); therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that are not subject to the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. IMC submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. IMC submitted an affidavit of publication of public notice for the January 29, 2003, issue of the *Great Falls Tribune*, a newspaper of general circulation in the Town of Great Falls in Cascade County, Montana, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving IMC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's potential to emit is below 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. Potential to Emit (PTE) > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or a lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3238-00 for IMC, the following conclusions were made.

   a. The facility's PTE is greater than 100 tons/year for PM, NO_x, and CO.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is not subject to any current NSPS.

   e. This facility is not subject to any current NESHAP standards except 40 CFR 63, Subpart M, Asbestos.

   f. This source is not a Title IV affected source, nor a solid waste combustion unit.

   g. This source is not an EPA designated Title V source.

   Based on these facts, the Department determined that IMC is a major source of emissions as defined under the Title V operating permit program. In accordance with ARM 17.8.1205(2)(c)(i), IMC submitted a Title V operating permit application concurrently with the Montana Air Quality Permit application for the current permit action.

III. BACT Determination

A BACT determination is required for each new or altered source. IMC shall install on the new or altered source the maximum air pollution control capability, which is technically practicable and economically feasible, except that BACT shall be utilized.

BACT is defined as an emission limitation, based on the maximum degree of reduction for each pollutant subject to regulation that would be emitted from a new or modified source for which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable for the new or modified unit through application of control(s). Under various circumstances, the Department may prescribe a design, equipment, work practice, operational standard, or a combination thereof, in lieu of an emission limit, to require the application of BACT. The decisions made in the following BACT analysis and determination are based on this definition of BACT.

A BACT analysis was submitted by IMC in Permit Application #3238-00, addressing some available methods of controlling PM/PM_{10}, NO_x, and CO emissions from the kiln process heaters at the proposed IMC facility. In addition, the Department conducted a BACT analysis for SO_2 and VOC emissions resulting from the kiln process heaters; a BACT analysis for PM/PM_{10} emissions resulting from material handling processes (barley, malt, and salable malt by-product) at the plant; and a BACT analysis for fugitive PM/PM_{10} emissions resulting from vehicle traffic and other facility operations associated with the haul roads, access roads, parking lots, and the general plant area. Further, based on comments received during the public comment period for Permit #3238-00, the Department conducted a BACT analysis for SO_2 emissions resulting from the burning of elemental sulfur during kiln operations.

The Department reviewed the proposed control methods, as well as previous BACT determinations for similar sources. The following control options have been analyzed by the Department through the BACT process.

A. Process Heater BACT Analysis

1. NO_x BACT Analysis

NO_x will be formed during the combustion of natural gas in the process heaters. NO_x formation occurs by three fundamentally different mechanisms. The principal mechanism of NO_x in natural gas combustion is thermal NO_x. The thermal NO_x mechanism occurs through the thermal dissociation and the subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion air. Most NO_x formed through the thermal NO_x mechanism occurs in the high temperature flame zone near the burners. The formation of thermal NO_x is affected by three factors: (1) oxygen concentration, (2) peak temperature, and (3) time of exposure at peak temperature. As these factors increase, NO_x emission levels increase.

The second mechanism of NO_x formation, called prompt NO_x, occurs through early reaction of nitrogen molecules in the combustion air and hydrocarbon radicals from the fuel. Prompt NO_x reactions occur within the flame and are usually negligible when compared to the amount of NO_x formed through the thermal NO_x mechanism. However, prompt NO_x levels may become significant with the use of ultra-low-NO_x burners.

The third mechanism of NO_x formation, called fuel NO_x, stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Due to the characteristically low fuel nitrogen content of natural gas, NO_x formation through the fuel NO_x mechanism for boilers fired with natural gas is insignificant.

NO_x Control Technology Identification

NO_x emissions from the process heaters can be reduced by several different methods. The following NO_x control technologies were analyzed for application to the process heaters at the proposed IMC facility. These control technologies can be applied individually or in combination:

- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)
- Staged Combustion or Dry Low NO_x
- Wet Controls
- No Add-On Control: Good Combustion Practices/Pipeline Quality Natural Gas

The following text provides an explanation and analysis of each selected control technology/strategy listed above.

a. SCR

SCR is a post combustion gas treatment technique that uses a catalyst to reduce NO and NO_2 to molecular Nitrogen (N), water (H_2O), and oxygen (O_2). Ammonia (NH_3) is commonly used as the reducing agent. The control efficiency for an SCR system is typically estimated to be between 60% and 90%. The basic chemical reactions are as follows:

$$4NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O$$
$$8NH_3 + 6NO_2 \rightarrow 7N_2 + 12H_2O$$

Ammonia vaporized and injected into the flue gas upstream of the catalyst bed combines with NO_x at the catalyst surface to form an ammonium salt intermediate. The ammonium salt intermediate then decomposes to produce elemental nitrogen and water. Another alternative is to inject an aqueous ammonia solution. Through this process the ratio of NH_3 to NO_x can be varied to achieve the desired level of NO_x reduction; however, increasing the ratio to greater than 1 results in increased un-reacted ammonia passing through the catalyst and into the atmosphere ("ammonia slip").

The catalyst lowers the temperature required for the chemical reaction between NO_x and NH_3. Catalysts used for the NO_x reduction include base metals, precious metals, and zeolites. Commonly, the catalyst of choice for the reaction is a mixture of titanium and vanadium oxides.

An attribute common to all catalysts is the narrow "window" of acceptable system temperatures. In the case of the proposed process heaters, the temperature window is approximately 400°F to 800°F. At temperatures below 400°F, the NO_x reduction reaction will not proceed. Operation at temperatures exceeding 800°F will shorten catalyst life and can lead to the oxidation of NH_3 to either nitrogen oxides (thereby increasing NO_x emissions) or possibly generating explosive levels of ammonium nitrate in the exhaust gas stream. The stack temperature for the process heaters is approximately 130°F for the 12 - 19.1 MMBtu/hr process heaters and 600°F for the 21 MMBtu/hr and 38 MMBtu/hr booster heaters. These temperatures make the use of SCR technically difficult for the 19.1 MMBtu/hr process heaters and feasible for the 21 MMBtu/hr and 38 MMBtu/hr booster heaters because the process temperature for these heating units falls within the window of acceptable system temperatures.

Other factors impacting the effectiveness of SCR include catalyst reactor design, operating temperature, the type of fuel fired, sulfur content of the fuel, design of the NH_3 injection system, and the potential for catalyst poisoning.

The SCR system is usually operated with wet injection and or low NO_x combustors. Data shows that an SCR operated alone allows a higher ammonia slip than does an SCR operated in conjunction with a wet or dry control technology. As previously described, the use of SCR invokes various technical problems including the narrow "window" of acceptable system temperatures, short catalyst life, a possible increase in thermal NO_x production due to high operating temperatures, and the possible production of explosive levels of ammonium nitrate. Also, the disposal of spent catalyst must be considered. Unlike zeolite and precious metal catalysts, base metal catalysts constitute a hazardous waste.

Finally, the annual costs of SCR for the 12 - 19.1 MMBtu/hr process heaters has been shown to be approximately \$2900/ton of NO_x reduction per kiln (4 process heaters/kiln and 3 total kilns) and \$3400/ton of NO_x reduction per booster heater (21 MMBtu/hr and 38 MMBtu/hr), making the cost effectiveness of SCR control questionably feasible from an economic standpoint. However, due to factors of technical infeasibility, the Department determined that SCR will not constitute BACT in this case.

b. SNCR

SNCR involves the non-catalytic decomposition of NO_x to nitrogen and water (see chemical reaction for SCR). A nitrogenous reducing agent, typically ammonia or urea, is injected into the upper reaches of the furnace. Because a catalyst is not used to drive the reaction, temperatures of 1600°F to 2100°F are required.

NO_x removal efficiency varies considerably for this technology, depending on inlet NO_x concentrations, fluctuating flue gas temperatures, residence time, amount and type of nitrogenous reducing agent, mixing effectiveness, and the presence of interfering chemical substances in the gas stream.

As with SCR, technical difficulties exist for SNCR application. Since SNCR requires a flue gas temperature of 1600°F to 2100°F and the stack temperature for the process heaters is approximately 130°F for the 12 - 19.1 MMBtu/hr process heaters and 600°F for the 21 MMBtu/hr and 38 MMBtu/hr booster heaters, additional burners would be required to raise the flue gas temperature. Additional burners would produce additional emissions and consume additional energy resources. Further, physical considerations limit the placement of reagent injection nozzles and an in-line duct burner to raise temperatures. Also, SNCR is not as widely used as SCR and may require additional research.

Finally, the annual operating/maintenance costs of SNCR for the 12 - 19.1MMBtu/hr process heaters have been shown to be approximately \$6600/ton of NO_x reduction per kiln (4 process heaters/kiln and 3 total kilns) and \$9200/ton of NO_x reduction per booster heater (21 MMBtu/hr and 38 MMBtu/hr), making the cost effectiveness of SNCR control economically infeasible. Therefore, due to factors of technical and economic infeasibility, the Department determined that SNCR will not constitute BACT in this case.

c. Staged Combustion (Dry Low NO_x (DLN))

Staged combustion, such as that provided by DLN, reduces NO_x emissions by a combination of several factors. First, a lack of available oxygen for NO_x formation in the fuel rich stage is due to off-stoichiometric firing. Second, the flame temperature may be lower in the first stage than the flame temperature in single stage combustion. Third, the peak temperature in the second stage (air rich) is lower. Staged combustion is an effective method for controlling both thermal and fuel NO_x due to this technology's ability to control the mixing of the fuel with the combustion air. Typical NO_x reduction effectiveness for DLN is approximately 80%. The NO_x reduction effectiveness depends on good burner operation, concentration of unburned hydrocarbon emissions, and poor ignition characteristics that occasionally occur under excessively fuel rich combustion circumstances.

The 21 MMBtu/hr booster heater incorporates DLN control as an integral part of the heating system. However, none of the 12 separate 19.1 MMBtu/hr process heaters or the 38 MMBtu/hr booster heater incorporate any kind of staged combustion control mechanism. Annual operation and maintenance costs for DLN technology for these process heaters is estimated to be approximately \$10,000/ton of NO_x reduction making the cost effectiveness of DLN and other staged combustion technologies economically infeasible. Therefore, staged combustion will not constitute BACT in this case.

d. Wet Controls

Water and/or steam injection technology has been shown to effectively suppress NO_x emissions from gas turbines, but not used as common control for process heaters such as that proposed. The injected fluid increases the thermal mass by dilution and thereby reduces peak temperatures in the flame zone.

NO_x reduction efficiency increases as the water-to-fuel ratio increases. For a maximum efficiency, the water must be atomized and injected with homogenous mixing throughout the combustor. This technique reduces thermal NO_x, but may actually increase the production of fuel NO_x. Depending on the initial NO_x load, wet injection control may reduce NO_x by as much as 60%. Because the there is potential for increased fuel NOx associated with wet controls, the Department determined that wet controls will not constitute BACT in this case.

e. No Add-On Controls: Good Combustion Practices/Pipeline Quality Natural Gas

Good combustion practices utilizing pipeline quality natural gas have been shown to produce relatively low NO_x emissions as compared with the combustion of other solid and liquid fuels. Further, these practices have no energy or economic impacts on IMC. Therefore, because the utilization of good combustion practices firing only pipeline quality natural gas is capable of significant NO_x reduction when compared to other fuels and is economically and technically feasible, this control strategy will constitute BACT in this case.

NOx BACT Summary and Determination

In summary, the Department analyzed the use of SCR, SNCR, Staged Combustion, Wet Controls, and no add-on control with proper combustion practices and burning only pipeline quality natural gas as possible NO_x control technologies/strategies for the kiln process heaters at the proposed IMC plant. Due to various technical and economic feasibility factors associated with the use of SCR, SNCR, Staged Combustion, and Wet Controls, as previously discussed, and the fact that good combustion practices burning only pipeline quality natural gas is capable of significant NO_x emissions reductions when compared to other fuels, the Department determined that good combustion practices firing only pipeline quality natural gas will constitute BACT for the control of NO_x emissions from these sources.

2. CO BACT Analysis

This BACT analysis considers the use of the following control technologies/strategies for the reduction of CO emissions resulting from the operation of the kiln process heaters:

- Oxidation of Post Combustion Gases: Catalytic and Thermal Oxidation
- No Add-On Control: Good Combustion Practices Utilizing Only Pipeline Quality Natural Gas

The following text provides an explanation and analysis of each selected control technology/strategy listed above.

a. Oxidation of Post-Combustion Gases: Catalytic and Thermal Oxidation

Oxidation of CO in post combustion gases may be accomplished through thermal oxidation with or without the assistance of a catalyst. The efficiency of these CO control technologies is typically near 80% effective. Although various specialized technologies exist, fundamentally, oxidizers, or incinerators, use heat to destroy CO in the gas stream. Incineration is an oxidation process that ideally breaks down the molecular structure of an organic compound into carbon dioxide and water vapor.

Temperature, residence time, and turbulence of the system affect CO control efficiency. A thermal oxidizer/incinerator generally operates at temperatures between 1450°F and 1600°F. Therefore, since thermal oxidation/incineration occurs at temperatures between 1450°F and 1600°F and the stack temperature for the process heaters is approximately 130°F for the 12 - 19.1 MMBtu/hr process heaters and 600°F for the 21 MMBtu/hr and 38 MMBtu/hr booster heaters, additional burners would be required to raise the flue gas temperature. Additional burners would produce additional emissions and consume additional energy resources.

Catalytic oxidation/incineration is similar to thermal oxidation/incineration; however, catalytic incineration allows for oxidation at lower temperatures ranging from 600°F to 1000°F. Therefore, since catalytic oxidation/incineration occurs at temperatures ranging from 600°F to 1000°F and the stack temperature for the process heaters is approximately 130°F for the 12 - 19.1 MMBtu/hr process heaters and 600°F for the 21 MMBtu/hr and 38 MMBtu/hr booster heaters, additional burners would be required to raise the flue gas temperature for the 12 - 19.1 MMBtu/hr process heaters and would likely be required for the two booster heaters. Additional burners would produce additional emissions and consume additional energy resources.

The catalyst systems that are used are typically metal oxides such as nickel oxide, copper oxide, manganese dioxide, or chromium oxide. Noble metals such as platinum and palladium may also be used. Due to the high temperatures required for complete destruction, fuel costs can be expensive and fuel consumption can be excessive with oxidation units. To lower fuel usage, regenerative thermal oxidizers (RTOs) or regenerative catalytic oxidizers (RCOs) can be used to preheat exhaust gases.

As previously described, oxidation of post-combustion gases invokes various technical problems including the need for high combustion temperatures and subsequent increased fuel use. The use of RTO's and/or RCO's can decrease fuel use needs. However, the cost effectiveness of using RTO or RCO was determined to be approximately $18,000/ton of CO reduction for these technologies, making oxidation of post-combustion gases economically infeasible. Therefore, the Department determined that oxidation of post-combustion gases will not constitute BACT in this case.

b. No Add-On Control: Good Combustion Practices/Pipeline Quality Natural Gas

In an ideal combustion process, all of the carbon and hydrogen contained within the fuel are oxidized to carbon dioxide (CO_2) and water (H_2O). The emission of CO in a combustion process is the result of incomplete organic fuel combustion.

Some fuels inherently reduce CO emissions due to physical characteristics. For example, pipeline quality natural gas generally results in much lower CO emissions as compared to various liquid or solid fuels in wide use. IMC has proposed the burning of only pipeline quality natural gas in the process heaters for the proposed project.

Also, reduction of CO can be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at the IMC facility will involve maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. This efficiency of fuel combustion will also minimize CO formation.

IMC has proposed the burning of only pipeline quality natural gas and using proper design and combustion practices to control CO emissions from the process heaters. Because these control strategies are capable of achieving significant CO reductions when compared to other fuels, have been utilized by many similar sources in the industry as a means of CO control, and because the other technologies analyzed under this BACT review have been shown to be economically infeasible, the Department considers the use of pipeline quality natural gas utilizing proper design and combustion practices to be BACT in this case.

CO BACT Summary and Determination

In summary, the Department analyzed the use of proper design and combustion and oxidation of post-combustion gases as possible CO control strategies for the process heaters. Due to various technical and economic feasibility factors associated with the oxidation of post combustion gases, as previously discussed, the Department determined that proper design and combustion practices with the use of pipeline quality natural gas only will constitute BACT in this case.

3. PM/PM_{10} BACT Analysis

PM and PM_{10} are formed during the combustion of fossil fuels in the kiln process heaters and from the airflow through the germinated barley in the kilns. The concentration of PM and PM_{10} can be reduced by using various control technologies. The following control technologies/strategies were analyzed through the BACT process:

- Fabric Filters (baghouses)
- Wet Scrubbers
- Electrostatic Precipitators (ESPs)
- No Add-On Control/Burning Only Pipeline Quality Natural Gas

The following text provides an explanation and analysis of each control technology listed above.

a. Baghouses

Baghouses consist of one or more isolated compartments containing rows of fabric filter bags or tubes. Gas flows pass through the fabric where the particles are retained on the upstream face of the bags, while the cleaned gas stream is vented to the atmosphere or on to another control device. Baghouses are effective for the control of particles from sub-micron to several hundred microns at gas temperatures up to about 500ºF.

Fabric filters can be characterized by the types of cleaning devices (shaker, reverse-air, and pulse-jet), direction of gas flow, location of the system fan, and the gas-flow quantity. Typically the type of cleaning method distinguishes the fabric filter.

Advantages to baghouses are the high collection efficiencies (in excess of 99%) and the collection of a wide range of particle sizes. The disadvantages include the narrow temperature window of up to approximately 500 to 550ºF (for typical installations), high pressure drops, and problems with gas streams that are corrosive or sticky.

IMC has proposed the burning of only pipeline quality natural gas and using proper design and combustion practices to control PM/PM_{10} emissions from the process heaters and kiln operations. Further, natural gas combustion, without add-on control, provides a significant reduction in potential PM/PM_{10} emissions when compared to other fuels commonly used for kiln operations. Further, IMC provided a cost effective analysis as part of the application for Montana Air Quality Permit #3238-00. The cost effectiveness for the reduction of PM/PM_{10} emissions from the process heaters and kiln operations was determined to be approximately $49,000 per ton removed and $12,000 per ton removed, respectively, making the addition of baghouse control cost prohibitive. Therefore, the Department determined that baghouse control for the process heaters and kiln operations will not constitute BACT in this case.

b. Wet Scrubbers

Wet scrubbers typically use water to impact, intercept, or diffuse a particle-laden gas stream. With impaction, particulate matter is accelerated and impacted onto a surface area or into a liquid droplet through devices such as venturis and/or spray chambers. When using interception, particles flow nearly parallel to the water droplets, allowing the water to intercept the particles. This strategy works most effectively for sub-micron particles. Spray augmented scrubbers and high-energy venturis employ this mechanism. Diffusion is used for particles of 0.5 micron (µm) or smaller and in situations where there is a large temperature difference between the gas and the scrubbing media. The particles migrate through the spray along lines of irregular gas density and turbulence, contacting droplets of approximately equal energy.

Six particle scrubber designs are used in control application such as that proposed: spray, wet dynamic, cyclonic spray, impactor, venturi, and augmented. In all of these scrubbing technologies, impaction is the mechanism for collecting particles larger than 3 µm. Since smaller sized particles respond to non-inertial forces, a high density of small droplets is needed to effectively trap these particles. This is accomplished at the price of high energy consumption due to hydraulic and velocity pressure losses.

The most widely used wet scrubbers are venturi scrubbers. With gas-side pressure drops exceeding 15 inches of water, particulate collection efficiencies of 85 percent or greater have been reported.

IMC has proposed the burning of only pipeline quality natural gas and using proper design and combustion practices to control PM/PM_{10} emissions from the process heaters and kiln operations. Further, natural gas combustion, without add-on control, provides a significant reduction in potential PM/PM_{10} emissions when compared to other fuels commonly used for kiln operations. Because potential PM/PM_{10} emissions from the process heaters and kiln operations are relatively minor at 9.42 (cumulative) tons per year (tpy) and 25.84 tpy, respectively, the addition of wet scrubber technology would be cost prohibitive. Therefore, the Department determined that wet scrubber control for the process heaters and kiln operations will not constitute BACT in this case.

c. ESPs

An ESP is a particulate control device that uses electric forces to move particles out of the gas stream and onto collector plates. The particles are given an electric charge by forcing them through a corona that surrounds a highly charged electrode, frequently a wire. The electrical field then forces the charged particles to the opposite charged electrode, usually a plate. Solid particles are removed from the collecting plate by a shaking process known as "rapping."

ESPs are employed when collection efficiencies of greater than 90 percent are required. ESPs are often used downstream of mechanical collector pre-cleaners that remove the larger size particulate matter. Collection efficiencies of 90 to 99 percent for PM/PM_{10} have been observed for ESPs.

IMC has proposed the burning of only pipeline quality natural gas and using proper design and combustion practices to control PM/PM_{10} emissions from the process heaters and kiln operations. Further, natural gas combustion, without add-on control, provides a significant reduction in potential PM/PM_{10} emissions when compared to other fuels commonly used for kiln operations. Because potential PM/PM_{10} emissions from the process heaters and kiln operations are relatively minor at 9.42 (cumulative) tons per year (tpy) and 25.84 tpy, respectively, the addition of ESP technology would be cost prohibitive. Therefore, the Department determined that ESP control for the process heaters and kiln operations will not constitute BACT in this case.

d. No Add-On Control/Burning Only Pipeline Quality Natural Gas

As previously discussed, IMC has proposed the burning of only pipeline quality natural gas and using proper design and combustion practices to control PM/PM_{10} emissions from the process heaters and kiln operations. Because burning only pipeline quality natural gas results in significant PM/PM_{10} reductions when compared to other fuels, is utilized by similar sources in the industry, and because the control technologies analyzed under this BACT review have been shown to be economically infeasible, the Department considers the use of pipeline quality natural gas utilizing proper design and combustion practices to be BACT in this case.

PM/PM_{10} BACT Summary and Determination

In summary, the Department analyzed the use of fabric filter baghouses, wet scrubbers, ESPs, and "no additional control" as possible PM/PM_{10} control technologies/strategies for the process heaters and kiln operations. All of the previously mentioned control strategies are capable of significant PM/PM_{10} emission reductions. However, because burning only pipeline quality natural gas results in significant PM/PM_{10} reductions when compared to other fuels, is utilized by similar sources in the industry, and because the control technologies analyzed under this BACT review have been shown to be economically infeasible, the Department considers the use of pipeline quality natural gas utilizing proper design and combustion practices to be BACT in this case.

4. SO_2 BACT Analysis

A physical property of pipeline quality natural gas is it's low sulfur content and subsequently low production of SO_2 during combustion reactions. Therefore, because IMC is required by permit to burn only pipeline quality natural gas for kiln operations, potential SO_2 emissions from this process are minimal at 0.74 tpy (cumulative) and the Department determined that the cost effectiveness of any SO_2 control technology would be prohibitive. The Department considers no additional control to be BACT in this case.

5. VOC BACT Analysis

A physical property of pipeline quality natural gas is the low production of VOCs during combustion reactions. Potential VOC emissions from this process are minimal at 6.81 tpy (cumulative). Because potential VOC emissions are minor, the Department determined that any add-on VOC control technology would be cost-prohibitive. Therefore, because IMC is required by permit to burn only pipeline quality natural gas for kiln operations, the Department considers no additional VOC control to be BACT in this case.

B. Material Handling (Barley, Malt, and Salable Malt By-Product) BACT Analysis

PM/PM_{10} BACT Analysis

The same control technologies/strategies analyzed for the collection of PM/PM_{10} from the kiln operations process heaters apply to the collection of particulate matter from the various barley and malt handling processes at the proposed facility, as described above. Therefore, the Department analyzed the use of ESPs, Wet Scrubbers, and Baghouses as possible PM/PM_{10} control technologies/strategies for the material handling processes at the plant. All of the previously mentioned control technologies/strategies are technically feasible and capable of significant PM/PM_{10} emission reductions; however, IMC proposed the use of fabric filter baghouse control, utilizing numerous pick-up points, 3-sided enclosures at material transfer locations, and covered conveyors to reduce PM/PM_{10} emissions from the proposed barley and malt handling operations at the facility. In addition, IMC proposed that all barley preparation operations will be housed in the headhouse, all unloading of barley shipments will be accomplished utilizing underground hoppers, the loading of all malt and salable malt by-product for shipment will utilize covered conveyors, and each material transfer point for grain receiving and off-loading will incorporate an enclosure (at least 3-sided) for fugitive emission control.

Because fabric filter baghouse control technologies are capable of achieving the permitted allowable PM/PM_{10} emission rate of 0.005 gr/dscf from the process baghouses, are technically feasible, and are commonly used for sources of this type, the Department considers the use of a fabric filter baghouse control with appropriate pick-up points, 3-sided enclosures at all material transfer locations, headhouse enclosure for barley preparation processes, and covered material transfer conveyors to be BACT in this case.

C. Fugitive Emissions: Haul Roads, Access Roads, Parking Areas, and General Plant Property

PM/PM_{10} BACT Analysis

IMC must take reasonable precautions to limit the fugitive emissions of airborne particulate matter on the haul roads, access roads, parking areas, and the general plant property. IMC shall use water spray and/or chemical dust suppressant, as necessary, to maintain compliance with the opacity and reasonable precautions limitations. The Department determined that using water spray and/or chemical dust suppressant, as necessary, to maintain compliance with the opacity requirements and reasonable precautions limitations constitutes BACT for these sources.

D. Process SO_2 Emissions: Elemental Sulfur Burning for Kiln Operations

SO_2 BACT Analysis

During the barley-malt kiln drying process, up to 500 pounds per kiln batch of elemental sulfur will be burned and the SO_2 combustion product mixed with the drying air to help preserve the malt product and kill harmful bacteria. As proposed, the remainder of SO_2, which is not absorbed in the process, will vent directly to the atmosphere. At the permitted emission rate of 83.33 lb/hr of SO_2 per kiln, each kiln has the potential to emit approximately 30 tpy of SO_2.

SO_2 Control Technology Identification

Based on comments received by the Department during the public comment period for Montana Air Quality Permit #3238-00, the Department determined that a more detailed discussion of SO_2 control technologies was justified for the current permit action. SO_2 emissions from this process can be reduced by several different methods. The Department analyzed the following SO_2 control technologies/strategies for application to the kiln batch process at the proposed IMC facility:

- Spray-Chamber/Spray-Tower
- Packed-Bed/Packed-Tower
- Impingement-Plate/Tray-Tower
- No Add-On Control

The following text provides an explanation and analysis of each control technology/strategy listed above.

a. Spray-Chamber/Spray-Tower

Spray chambers can be used to control inorganic gases (including SO_2) with SO_2 removal efficiencies in the range of 80-99%. Current applications have removal efficiencies typically exceeding 90%. Spray chambers are a popular wet scrubbing configuration used to bring waste gases in contact with an absorbent designed to react with SO_2, in this case. Typical air-flows for spray-chambers range from 1500 standard cubic feet per minute (scfm) to 100,000 scfm and are most effective when pollutant loading is in the range of 250 to 10,000 parts per million (ppm_v). Annualized costs for scrubbers of this type typically range from $1.45 to $48.00 per scfm (EPA-CICA Fact Sheet, Spray Tower Scrubber, 2003). The kiln operations proposed under the current permit action have an approximate air-flow capacity of 713,000 scfm per kiln. Therefore, the minimum cost for SO_2 removal for each kiln with a spray chamber installed is calculated as follows:

($1.45/scfm*yr) * (713,000 scfm/kiln) / (30 tons SO_2/yr/kiln) * (99% control) = $34,800/ton SO_2 removed

Based on the above calculation demonstrating the cost effectiveness of applying spray-chamber/spray-tower technology, the application of this technology would be cost-prohibitive and well above industry norms. Therefore, the Department determined that spray-chamber/spray-tower technology will not constitute BACT in this case.

b. Packed-Bed/Packed-Tower

Packed-bed scrubbers are used primarily to remove inorganic gases (including SO_2) with removal efficiencies in the range of 95-99%. Packed-bed scrubbers have been used in the food and agriculture industries, similar to the proposed barley malt production facility.

Typical air-flows for packed-bed scrubbers are in the range of 500 scfm to 75,000 scfm. Packed-bed scrubbers, like the previously discussed spray-chamber/spray-tower technology, are most effective when pollutant loading is in the range of 250 to 10,000 parts per million (ppm_v). Annualized costs for scrubbers of this type typically range from $17.00 to $78.00 per scfm (EPA-CICA Fact Sheet, Spray Tower Scrubber, 2003). The kiln operations proposed under the current permit action have an approximate air-flow capacity of 713,00 scfm per kiln. Therefore, the minimum cost for SO_2 removal for each kiln with a packed bed installed is calculated as follows:

($17.00/scfm*yr) * (713,000 scfm/kiln) / (30 tons SO_2/yr/kiln) * (99% control) = $418,400/ton SO_2 removed

Based on the above calculation demonstrating the cost effectiveness of applying packed-bed/packed-tower technology, the application of this technology would be cost-prohibitive and well above industry norms. Therefore, the Department determined that packed-bed/packed-tower technology will not constitute BACT in this case.

c. Impingement-Plate/Tray-Tower

Impingement-plate scrubbers are used primarily to remove inorganic gases (including SO_2) with removal efficiencies in the range of 80-99%. Current applications have removal efficiencies greater than 90%. Impingement-plate scrubbers are typically used in the food and agriculture industries, similar to the proposed barley malt production facility. Typical air-flows for impingement-plate scrubbers are in the range of 1000 scfm to 75,000 scfm. Annualized costs for scrubbers of this type typically range from $2.80 to $71.00 per scfm (EPA-CICA Fact Sheet, Spray Tower Scrubber, 2003). The kiln operations proposed under the current permit action have an approximate air-flow capacity of 713,00 scfm per kiln. Therefore, the minimum cost for SO_2 removal for each kiln with a impingement-plate scrubber installed is calculated as follows:

($2.80/scfm*yr) * (713,000 scfm/kiln) / (30 tons SO_2/yr/kiln) * (99% control) = $67,200/ton SO_2 removed

Based on the above calculation demonstrating the cost effectiveness of applying impingement-plate/tray-tower technology, the application of this technology would be cost-prohibitive and well above industry norms. Therefore, the Department determined that impingement-plate/tray-tower technology will not constitute BACT in this case.

d. No Add-On Control

As detailed above, the addition of add-on SO_2 control for the reduction of SO_2 from the burning of elemental sulfur during kiln operations would be cost prohibitive. Based on the economic infeasibility of add-on SO2 control for kiln operations, the Department determined that no add-on controls will constitute BACT in this case.

SO_2 BACT Summary and Determination

Based on the information provided above, the addition of scrubber control for SO_2 emissions resulting from elemental sulfur burning during kiln operations would be cost prohibitive. Further, the cost estimates are likely conservative given that air-flow rates for each kiln are approximately 9 times greater than the recommended design flow rate for each respective scrubber type and the Department used a conservative emission control estimate of 99% efficiency. Further, under the current proposal, the SO_2 loading is expected to be less than 10 ppm_v which is approximately 25 times lower than the lowest recommended SO_2 loading for the scrubbers analyzed; thereby highlighting potential technical problems with scrubber application. Therefore, because scrubber control has been shown to be economically infeasible and SO_2 emissions from each kiln are relatively low, the Department determined that no add-on control will constitute BACT in this case.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. Emission Inventory

	tons/year					
Emission Source	**PM**	**PM_{10}**	**NO_x**	**CO**	**VOC**	**SO_x**
Process Baghouse #1 (25,000 dscfm)	18.77	4.69	0.00	0.00	0.00	0.00
Process Baghouse #2 (25,000 dscfm)	18.77	4.69	0.00	0.00	0.00	0.00
Process Baghouse #3 (25,000 dscfm)	18.77	4.69	0.00	0.00	0.00	0.00
Process Baghouse #4 (10,000 dscfm)	7.51	1.88	0.00	0.00	0.00	0.00
Process Baghouse #5 (35,000 dscfm)	26.28	6.57	0.00	0.00	0.00	0.00
Process Baghouse #6 (25,000 dscfm)	18.77	4.69	0.00	0.00	0.00	0.00
Process Baghouse #7 (35,000 dscfm)	26.28	6.57	0.00	0.00	0.00	0.00
Process Baghouse #8 (35,000 dscfm)	26.28	6.57	0.00	0.00	0.00	0.00
Kiln Dryers (12 heaters @ 19.1 MMBtu/heater)	7.49	7.49	98.52	82.76	5.42	0.59
Booster Heater #1 (21 MMBtu/hr)	0.69	0.69	9.02	7.57	0.50	0.05
Booster Heater #2 (38 MMBtu/hr)	1.24	1.24	16.32	13.71	0.90	0.10
Elemental Sulfur Burning – Kiln Operations	0.00	0.00	0.00	0.00	0.00	91.25
Fugitive: Grain Receiving	0.80	0.18	0.00	0.00	0.00	0.00
Fugitive: Kiln Operations	25.84	23.12	0.00	0.00	0.00	0.00
Fugitive: Load-Out Operations	1.17	0.39	0.00	0.00	0.00	0.00
Fugitive: Vehicle Traffic	0.75	0.43	0.00	0.00	0.00	0.00
Total Emissions:	**199.41**	**73.89**	**123.86**	**104.04**	**6.81**	**91.99**
Title V Applicable Emissions	**170.85**	**49.77**	**123.86**	**104.04**	**6.81**	**91.99**

Process Baghouse #1, #2, #3, and #6

Air Flow Capacity: 25,000 dscfm (Company Information)
Operating Hours: 8760 hr/yr

PM Emissions

Emission Factor: 0.02 gr/dscf (Permit Limit)
Calculations: 0.02 gr/dscf * 25000 dscf/min * 60 min/hr * 1 lb/7000 gr = 4.29 lb/hr
4.29 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 18.77 ton/yr

PM_{10} Emissions

Emission Factor: 0.005 gr/dscf (Permit Limit)
Calculations: 0.005 gr/dscf * 25000 dscf/min * 60 min/hr * 1 lb/7000 gr = 1.07 lb/hr
1.07 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 4.69 ton/yr

Process Baghouse #5, #7, and #8

Air Flow Capacity: 35,000 dscfm (Company Information)
Operating Hours: 8760 hr/yr

PM Emissions

Emission Factor:	0.02 gr/dscf (Permit Limit)	
Calculations:	0.02 gr/dscf * 35000 dscf/min * 60 min/hr * 1 lb/7000 gr =	6.00 lb/hr
	6.00 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	26.28 ton/yr

PM_{10} Emissions

Emission Factor:	0.005 gr/dscf (Permit Limit)	
Calculations:	0.005 gr/dscf * 35000 dscf/min * 60 min/hr * 1 lb/7000 gr =	1.50 lb/hr
	1.07 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	6.57 ton/yr

Process Baghouse #4

Air Flow Capacity: 10,000 dscfm (Company Information)
Operating Hours: 8760 hr/yr

PM Emissions

Emission Factor:	0.02 gr/dscf (Permit Limit)	
Calculations:	0.02 gr/dscf * 10000 dscf/min * 60 min/hr * 1 lb/7000 gr =	1.71 lb/hr
	1.71 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	7.51 ton/yr

PM_{10} Emissions

Emission Factor:	0.005 gr/dscf (Permit Limit)	
Calculations:	0.005 gr/dscf * 10000 dscf/min * 60 min/hr * 1 lb/7000 gr =	0.43 lb/hr
	0.43 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.88 ton/yr

Kiln Dryers (3 kilns with a total of 12 Process Heaters @ 19.1 MMBtu/hr)

Heat Input Capacity: 19.12 MMBtu/hr/heater
Number of Heaters: 12 heaters (4 heaters/kiln)
Total Heat Input: 229.44 MMBtu/hr
Natural Gas Heating Value: 1020 MMBtu/MMscf (AP-42, Chapter 1.4)
Operating Hours: 8760 hr/yr

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 229.44 MMBtu/hr =	1.71 lb/hr
	1.71 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	7.49 ton/yr

PM10 Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 229.44 MMBtu/hr =	1.71 lb/hr
	1.71 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	7.49 ton/yr

NOx Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	100 lb/MMscf * 1 MMscf/1020 MMBtu * 229.44 MMBtu/hr =	22.49 lb/hr
	22.49 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	98.52 ton/yr

- Permitted pound per hour emission limits were established using the applicable lb/MMBtu emission rate for each process heater.

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 229.44 MMBtu/hr =	18.90 lb/hr
	18.90 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	82.76 ton/yr

- Permitted pound per hour emission limits were established using the applicable lb/MMBtu emission rate for each process heater.

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 229.44 MMBtu/hr =	1.24 lb/hr
	1.24 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	5.42 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 229.44 MMBtu/hr =	0.13 lb/hr
	0.13 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.59 ton/yr

Booster Heater #1 (21 MMBtu/hr)

Heat Input Capacity:	21 MMBtu/hr/heater
Natural Gas Heating Value:	1020 MMBtu/MMscf (AP-42, Chapter 1.4)
Operating Hours:	8760 hr/yr

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 21 MMBtu/hr =	0.16 lb/hr
	0.16 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.69 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 21 MMBtu/hr =	0.16 lb/hr
	0.16 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.69 ton/yr

NOx Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	100 lb/MMscf * 1 MMscf/1020 MMBtu * 21 MMBtu/hr =	2.06 lb/hr
	2.06 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	9.02 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 21 MMBtu/hr =	1.73 lb/hr
	1.73 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	7.57 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 21 MMBtu/hr =	0.11 lb/hr
	0.11 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.50 ton/yr

SOx Emissions

Emission Factor:	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 21 MMBtu/hr =	0.01 lb/hr
	0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.05 ton/yr

Booster Heater #2 (38 MMBtu/hr)

PM Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 38 MMBtu/hr =	0.28 lb/hr
	0.28 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.24 ton/yr

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	7.6 lb/MMscf * 1 MMscf/1020 MMBtu * 38 MMBtu/hr =	0.28 lb/hr
	0.28 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	1.24 ton/yr

NOx Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	100 lb/MMscf * 1 MMscf/1020 MMBtu * 38 MMBtu/hr =	3.73 lb/hr
	3.73 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	16.32 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	84 lb/MMscf * 1 MMscf/1020 MMBtu * 38 MMBtu/hr =	3.13 lb/hr
	3.13 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	13.71 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMscf (AP-42, Table 1.4-2)	
Calculations:	5.5 lb/MMscf * 1 MMscf/1020 MMBtu * 38 MMBtu/hr =	0.20 lb/hr
	0.20 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.90 ton/yr

SOx Emissions

Emission Factor: 0.6 lb/MMscf (AP-42, Table 1.4-2)
Calculations: 0.6 lb/MMscf * 1 MMscf/1020 MMBtu * 38 MMBtu/hr = 0.02 lb/hr
0.02 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.10 ton/yr

Elemental Sulfur Burning – Kiln Operations

Molecular Weight (Sulfur):	32 lb/mol
Molecular Weight (SO_2):	64 lb/mol
Batch Process Duration:	36 hrs/batch (Company Information)
Sulfur Burning Duration - Batch Process:	3 hr/kiln batch (Company Information)
Maximum Sulfur Burned/Batch:	500 lb/kiln batch (Permit Limit)
Barley – Sulfur Absorption:	75% (Company Information – Conservative Estimate)
Kiln Throughput Capacity:	380 ton/batch/kiln (Company Information)
Number Of Kilns:	3 kilns
Operating Hours:	8760 hr/yr

Combined Total Barley Throughput Capacity (3 Kilns)
Calculations: 380 ton/batch/kiln * 1 batch/36 hr/kiln * 8760 hr/yr * 3 kilns = 277,400 ton/yr

Total Number of Batches Processed/Year (3 Kilns)
Calculations: 277,400 ton/yr * 1 batch/380 tons = 730 batches/yr (combined 3 kiln capacity)

Sulfur Burning Duration:

Calculations: 730 batches/yr * 3 hr S burning/batch = 2190 hr S burning/yr

Sulfur Burning Capacity:

Calculations: 500 lb S/batch * 730 batches/yr = 365,000 lb S burned/yr

SO_x Emissions:

Calculations: 500 lb/kiln batch * 1 kiln batch/3 hrs * 64 lb SO_2/32 lb S * (1-0.75) = 83.33 lb/hr
83.33 lb/hr * 3 hr/batch * 730 batches/yr * 0.0005 ton/lb = 91.25 ton/yr

Fugitive Emissions: Grain Receiving Pits

Barley Density: 48 lb/bu

Process Rate: 19,000,000 bu/yr (Proposed Limit)
Conversion: 48 lb/bu * 19,000,000 bu/yr * 0.0005 ton/lb = 456,000 ton/yr (Permit Limit)

PM Emissions

Emission Factor: 0.035 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Hopper Truck)
Emission Control: 90% (3-sided enclosure)
Calculations: 0.035 lb/ton * 456,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 0.80 ton/yr

PM_{10} Emissions

Emission Factor: 0.0078 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Hopper Truck)
Emission Control: 90% (3-sided enclosure)
Calculations: 0.0078 lb/ton * 456,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 0.18 ton/yr

Fugitive Emissions: Malt Kilns (3)

Malt Density: 34 lb/bu

Process Rate: 16,000,000 bu/yr (Company Information)
Conversion: 34 lb/bu * 16,000,000 bu/yr * 0.0005 ton/lb = 272,000 ton/yr

PM Emissions

Emission Factor: 0.19 lb/ton (AP-42, Table 9.9.1-2)
Calculations: 0.19 lb/ton * 272,000 ton/yr * 0.0005 ton/lb = 25.84 ton/yr

PM_{10} Emissions

Emission Factor: 0.17 lb/ton (AP-42, Table 9.9.1-2)
Calculations: 0.17 lb/ton * 272,000 ton/yr * 0.0005 ton/lb = 23.12 ton/yr

Fugitive Emissions: Malt Load-Out (2 spouts @ 190 tph & 2 spouts at 100 tph)

Process Rate: 272,000 ton/yr (Malt Production Capacity)

PM Emissions

Emission Factor: 0.086 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Truck)
Emission Control: 90% (3-sided enclosure/load-out spout)
Calculations: 0.086 lb/ton * 272,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 1.17 ton/yr

PM_{10} Emissions

Emission Factor: 0.029 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Truck)
Emission Control: 90% (3-sided enclosure/load-out spout)
Calculations: 0.029 lb/ton * 272,000 ton/yr * (1-0.9) * 0.0005 ton/lb = 0.39 ton/yr

Fugitive Emissions: Vehicle Traffic

Assumptions:

$E = k\,(sL/2)^{0.65} * (W/3)^{1.5}$ (AP-42, Section 13.2.1.3, 10/02)

Where:

k = 0.028 Particle size multiplier for PM_{10} and units of interest, lb/VMT (AP-42, Section 13.2.1.3, 10/02)
k = 0.016 Particle size multiplier for PM_{10} and units of interest, lb/VMT (AP-42, Section 13.2.1.3, 10/02)
sL = 0.5 Road surface silt loading, g/m^2 (worst case default; AP-42, Section 13.2.1.3, 10/02)

W = 20	Average vehicle weight, tons (assumed)
E = 0.196	PM emission factor, lb/VMT (calculated)
E = 0.112	PM_{10} emission factor, lb/VMT (calculated)
n = 2	Number of trucks per hour (Company Information)
VMT = 0.44	Vehicle miles traveled (calculated from site plan, permit #3238-00)

PM Emissions

Emission Factor: 0.172 lb/hr (calculated PM emission rate)
Calculations: 0.172 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.75 ton/yr

PM_{10} Emissions

Emission Factor: 0.098 lb/hr (calculated PM_{10} emission rate)
Calculations: 0.098 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.43 ton/yr

V. Existing Air Quality

The air quality of the proposed area of operation is considered attainment/unclassified for all pollutants. Until recently, a narrow area along 10th Avenue South (bounded by 9th Avenue South on the north, 11th Avenue South on the south, 54th Street South on the east and 2nd Street South on the west) was classified as a non-attainment area for CO but has since been re-designated to attainment area status under a limited maintenance plan (LMP). This re-designation became effective on July 8, 2002.

VI. Ambient Air Impact Analysis

The Department determined, based on ambient air modeling, that the impact from this permitting action will be minor. The Department believes it will not cause or contribute to a violation of any ambient air quality standard.

The maximum estimated emissions are approximately 123.8 tons per year (tpy) of NO_x, 103.6 tpy of CO, 73.3 tpy of PM_{10}, 6.3 tpy of volatile organic compounds (VOCs), and 90.8 tpy of SO_2. The air quality classification for Great Falls is "Unclassifiable or Better than National Standards" (40 CFR 81.327) for all pollutants. As described in Section V above, a narrow area along 10th Avenue South was previously classified as a non-attainment area for CO but has since been re-designated as attainment under an LMP. This re-designation became effective on July 8, 2002.

IMC submitted air dispersion modeling to demonstrate compliance with the Montana and National Ambient Air Quality Standards (MAAQS and NAAQS) and the Class II PSD increments for SO_2, NO_x, and PM_{10}. IMC was not required to demonstrate compliance with the SO_2 MAAQS for all existing sources because nearby Montana Refining Company (MRC) does not show compliance with the MAAQS and, as an existing source, is exempt from this demonstration requirement. The minor source baseline dates for NO_x, PM_{10}, and SO_2 have also been established in the area so a Class II increment analysis was required and performed. In addition, due to a recent increase in industrial development in the proposed area, the Department requested IMC perform a Class I NO_x Increment analysis.

The ISC-PRIME model was used along with 5 years of meteorological data (1987-1991) collected at the Great Falls International Airport - National Weather Station.

Building downwash effects from the facility were calculated using the EPA developed Building Profile Input Program for use with the ISC-PRIME (BPIP-PRIME). The receptor grid elevations were derived from digital elevation model (DEM) files using the United States Geological Survey (USGS) 7.5-minute series (1:24,000 scale) digitized topographical maps. The receptors were placed at 50-meter intervals along the property boundaries, 100-meter intervals from the property boundaries to 1 kilometer, 250-meter intervals from 1 to 5 kilometers, and at 500-meter intervals from 5 to 8 kilometers. In addition, receptors were placed randomly along the Class I boundaries of the Gates of the Mountains Wilderness; Scapegoat Wilderness; Bob Marshall Wilderness; UL Bend Wilderness, and Glacier National Park, for the PSD Class I increment compliance demonstration.

Table 1 identifies the design concentrations and modeling parameters entered into the model for the IMC facility.

Table 1. Source Physical Parameters and Emission Rates

Source ID	Easting (X) (m)	Northing (Y) (m)	Stack Height (ft)	Temp (°F)	Exit Velocity (ft/s)	Stack Diameter (ft)	CO (lb/hr)	NOX (lb/hr)	PM (lb/hr)	SO2 1-3 Hr (lb/hr)	SO2 24hr & Annual (lb/hr)	VOC (lb/hr)
BF01	480383.6	5265614	90	68	132.6	2	0	0	1.07	0	0	0
BF02	480375.9	5265614	90	68	132.6	2	0	0	1.07	0	0	0
BF03	480366.7	5265614	90	68	132.6	2	0	0	1.07	0	0	0
BF04	480376.7	5265579	180	68	94.3	1.5	0	0	0.43	0	0	0
BF05	480372.2	5265579	180	68	118.8	2.5	0	0	1.5	0	0	0
BF06	480381.1	5265579	180	68	132.6	2	0	0	1.07	0	0	0
BF07	480382.6	5265601	65	68	118.8	2.5	0	0	1.5	0	0	0
BF08	480382.6	5265595	65	68	118.8	2.5	0	0	1.5	0	0	0
SV3	480334.9	5265537	65	131	118.9	2	6.27	7.5	0.54	0.08	0.08	0.38
SV4	480297	5265539	65	131	118.9	2	6.27	7.5	0.54	0.08	0.08	0.38
SV5	480248.7	5265554	65	131	118.9	2	6.27	7.5	0.54	0.08	0.08	0.38
SV10	480240.4	5265529	150	600.01	75.3	1.8	4.84	5.78	0.41	0.06	0.06	0.3
KLN1	480321.2	5265551	42	100	80.2	15.6	0	0	0.6	83.3	10.42	0
KLN2	480281	5265551	42	100	80.2	15.6	0	0	0.6	83.3	10.42	0
KLN3	480240	5265551	42	100	80.2	15.6	0	0	0.6	83.3	10.42	0

Volume Sources

Source Description	Source ID	Release Ht (m)	σy (m)	σy (m)	----------
Grain Receiving & Loadout Spouts	LOADR CV1	15	4.0	4.0	----------
	LOADR CV2	15	4.0	4.0	----------
Truck Traffic[a]	HRD_* **	3.5	14.0	1.3	Truck Traffic contains 24 individual Sources

PM_{10}, NO_2, and SO_2 emissions exceeded the modeling significance levels thus; additional modeling was necessary to demonstrate compliance with the NAAQS, MAAQS, and applicable PSD increments. The largest identified radius for determining the significant impact area for this project was the 3-hour SO_2 averaging period, which extended 11.9 kilometers. CO was below the modeling significance so no additional modeling was conducted for CO emissions.

The NAAQS/MAAQS demonstration and Class I/II analyses were performed with the following sources: MRC, Malmstrom Air Force Base (MAFB), Agri-Technology Corporation (Agri-Tech), and Montana First Megawatts Project (MFMP). The NAAQS/MAAQS analyses for NO_x, SO_2, and PM_{10} were conducted using the potential emissions from IMC, MRC, MAFB, Agri-Tech, and MFMP. The results of the NAAQS/MAAQS analysis are summarized in Table 2.

Table 2. NAAQS/MAAQS Ambient Modeling Results

Pollutant	Avg. Period	Modeled Conc. ($\mu g/m^3$)	Background Conc. ($\mu g/m^3$)	Ambient Conc. ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	% of NAAQS	MAAQS ($\mu g/m^3$)	% of MAAQS
PM_{10}	24-hr	27.5	61	88.5	150	59	150	59
	Annual	10.7	21	31.7	50	63.4	50	63.4
NO_2	1-hr	306.9	75	381.9	------	------	564	67.7
	Annual [a]	33.6	6	39.6	100	39.6	94	35.7
SO_2	1-hr	1266.2	35	1301.2	------	------	1,300	>100
	3-hr	1266.2	26	1292.2	1,300	99.4	------	NA
	24-hr	344.0	11	355	365	97.2	365	NA
	Annual	76.7	3	79.7	80	99.6	52	NA

[a] Neither the Ozone Limiting Method or Ambient Ratio Method were applied to these results.

Note that the SO_2 MAAQS are exceeded, which is a result of MRC's SO_2 emissions. MRC is an existing source (i.e. grand-fathered source) and is not required to demonstrate compliance with the MAAQS. MRC currently has a permit with SO_2 limits to demonstrate compliance with the NAAQS. However, IMC demonstrated compliance with the MAAQS on an individual basis (i.e. not taking into account MRC SO_2 emissions).

The results for the Class I and Class II demonstrations for NO_x are summarized in Table 3. PM_{10} and SO_2 Class I Increment were not required because this facility is not a PSD source. The NO_2 increment was conducted at the Department's request as a result of the recent increase in the industrial development of the proposed area.

Table 3. Class I and II Modeling Results

Pollutant	Avg. Period	Class II Modeled Conc. ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)	% Class II Increment Consumed	Class I Modeled Conc. ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)	% Class II Increment Consumed
PM_{10}	24-hr	27.5	30	91.7	----	8	----
	Annual	10.7	17	62.9	----	4	----
SO_2	3-hr	476	512	92.9	----	25	----
	24-hr	39.9	91	43.8	----	5	----
	Annual	12.9	20	64.5	----	2	----
NOx	Annual[a]	23	25	92.0	0.006	2.5	0.2

[a] The modeled concentration was 30.58 $\mu g/m^3$ (30.058 * 0.75 = 23.0$\mu g/m^3$).

The Ambient Ratio Method and the Ozone Limiting Method were not applied to the modeled NO_x emissions to convert the modeled concentrations to NO_2 for comparison with the NAAQS/MAAQS. Therefore, these results may be considered conservative for the NAAQS/MAAQS demonstration. However, the Ambient Ratio Method was used to convert the modeled NO_x concentration to NO_2 for comparison against the Class II increment. The reported values include the highest modeled concentrations for both the combined and simple cycle scenarios proposed for the previously permitted MFMP facility.

As shown in the above-discussed modeling demonstration, impacts from the proposed IMC project should not contribute to a violation of the MAAQS/NAAQS and/or the PSD Class I/II increment.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air and Waste management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: International Malting Company, LLC – Great Falls
P.O. Box 712
Milwaukee, WI 53201

Air Quality Permit number: 3238-00

Preliminary Determination Issued: April 2, 2003
Department Decision Issued: May 1, 2003
Permit Final: May 17, 2003

1. *Legal Description of Site*: The IMC facility is located approximately 2 miles north of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE¼ of the SE¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

2. *Description of Project*: IMC is proposing the construction and operation of a barley malt manufacturing plant with a malt and salable malt by-product production capacity of 16 million bushels per year. Construction and operation of the proposed malting plant would occur in two phases. After construction of Phase I, the malting plant would have the capacity to produce from 8 to 10 million bushels of malt and salable malt by-product per year. After construction of Phase II, the malting plant capacity would increase to a maximum of 16 million bushels of malt and salable malt by-product per year. IMC would commence Phase II operations within 3 years of the commencement of Phase I operations.

3. *Objectives of Project*: The objective of the proposed project would be to construct and operate a barley malt manufacturing plant to produce malt product for sale and use in various industries world-wide including, but not limited to, beer manufacturers.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because IMC demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in Permit #3238-00.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements, demonstrate compliance with those requirements, and that these conditions do not unduly restrict private property rights.

7. *Pre-Assessment Site Visit*: On March 11, 2003, the Department conducted a site visit to evaluate the proposed site location. In addition to information gathered during the permit application process, various decisions/assessments contained in the following evaluation are based on information collected during the site visit.

8. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Overall, impacts from this project to terrestrial and aquatic life and habitats would be minor because of the relatively small portion of land that would be disturbed and the minor impact to the surrounding area from the air emissions (considering the air dispersion characteristics of the area). Terrestrials (such as deer, antelope, rodents) would use the general area of the facility. The area around the facility would be fenced to limit access to the facility. However, the fencing would likely not restrict access from all animals that frequent the area, but it may discourage some animals from entering the facility property.

The predominant use of the surrounding area is currently for agricultural purposes and would remain an agricultural area. Also, other industrial sources, including Montana Refining Company (MRC), Malmstrom Air Force Base (MAFB), and Agri-Technology Corporation (Agri-Tech) would be located within a few miles of the IMC property boundary. In addition, Northwestern Energy – Montana First Megawatts, LLC, Project (MFMP) is permitted for construction and operation adjacent to the proposed IMC site, but has not begun significant construction activities as of the date of issuance of this permit. Overall, the predominant industrial/agricultural character of the proposed project area would not change as a result of the proposed IMC facility.

Aquatic life and habitats would realize little or no impact from the proposed facility because IMC is not proposing to directly discharge any material to the surface or ground water in the area. The malting plant would require access to approximately 2 million gallons of water per day for use in consumptive and non-consumptive purposes. The city annexation (sewer and water) portion of the proposed project would result in very little impact on the terrestrial and aquatic life and habitats because the activities would result in minimal disturbance to land/water and the disturbances would be temporary in those areas that are not already disturbed. The sewer and water system upgrade may require the use of motor vehicles, but again, the impacts would be minor and of a short time duration.

Further, the modeling analysis (see Section VI of the permit analysis and Section 8.F of this EA) of the air emissions from this facility indicates that the impacts from potential emissions on land or surface water would be very minor and would consume only a small portion of the ambient air quality standards. The small amount of air impact would correspond to an equally small amount of deposition resulting in only minor impacts to any terrestrial and aquatic life and habits in the proposed area of operation. The national and Montana ambient air quality standards (NAAQS/MAAQS) include two types of standards, primary and secondary. Secondary Standards set limits to protect public welfare, including, but not limited to, protection against decreased visibility, damage to animals, crops, vegetation, and buildings. IMC, through the previously cited air dispersion modeling, demonstrated compliance with these standards; therefore, impacts to terrestrial and aquatic life and habitats from air pollution would be minor and in compliance with the applicable secondary standards. Overall, any impact to any terrestrial and aquatic life and habitat resources in the proposed area of operation would be minor.

B. Water Quality, Quantity, and Distribution

The proposed malting plant would result in minor impacts to water quality in the proposed area because the operations would result in air emissions, which may impact surrounding sources of water. However, as described in Section VI of the permit analysis and Section 8.F of this EA, any impact to water quality would be minor due to the relatively low concentration of pollutants emitted and dispersion characteristics of the pollutants in the proposed area of operation.

Further, the proposed facility would not directly discharge any material to the surface or ground water in the area, rather, total facility discharge requirements would be annexed into the existing City of Great Falls water sewage systems. In addition, the proposed demands for potable water to provide services to facility employees and non-process water use requirements would be acquired through the existing City of Great Falls water system.

The water requirements for the malting plant operations would be met from various sources including the Giant Springs, city water, water recycled from facility operations, and treated water from the city wastewater treatment plant. The Giant Springs are natural water springs that would be accessible from the proposed location of the malt plant. Currently, the Montana Department of Fish, Wildlife, and Parks (FWP) holds rights to 16,000 gallons per minute (gpm) from the Giant Springs that are appropriated through the existing fish hatchery system. However, the maximum capacity of the diversion and delivery system to the fish hatchery is estimated to be in excess of 16,000 gpm. Therefore, the capacity of the existing diversion system at Giant Springs is more than the maximum water right demand of the fish hatchery. Any water that is presently diverted into the FWP system, and is not actually used in the fish hatchery, is returned directly to the nearby Missouri River. According to the U.S. Geological Survey, the Giant Springs flow at approximately 200 cubic feet per second (cfs) while the amount of water requested for IMC operations is approximately 3-4 cfs or 1500 gpm.

While the proposed project would require a relatively large quantity of water for normal operations, the consumptive portion of the water demands would be relatively minor. Of the 1,500 gpm required for IMC operations, approximately 80% or 1200 gpm would be non-consumptive. The water that is not consumed during IMC operations would be treated at the City of Great Falls waste water treatment plant and returned to the Missouri River, upstream of the Giant Springs.

Further, any new water right, for consumptive purposes, is prohibited on the upper Missouri River (proposed water use area). Therefore, to account for the remaining 300 gpm consumed during the IMC process, IMC would contract with the City of Great Falls for 300 gpm of water available from the City's water reservation in the Missouri River. To account for this water, the City of Great Falls would seek approval from the Montana Department of Natural Resources and Conservation (DNRC) to change 300 gpm of the City's existing Missouri River water reservation to the Giant Springs for dedication to the proposed IMC project. The City's water reservation specifically includes the right to use water for industrial purposes. Overall, any impact to water quality, quantity, and distribution in the proposed area of operations would be minor.

C. Geology and Soil Quality, Stability and Moisture

Impacts to the geology and soil quality, stability, and moisture from this facility would be minor because the project would impact a relatively small portion of land and the amount of resulting deposition of the air emissions would be small, as described in Section VI of the permit analysis and Section 8.F of this EA. Approximately 20 acres or less would be disturbed for the physical construction of the barley malt manufacturing plant.

Soil stability in the immediate vicinity of the proposed facility would likely be impacted by the new footings and foundations required for the facility. The major construction required for the facility would be the headhouse (400 meters long by 25 meters wide by 33 meters high); 4 germination vessels; three kiln vessels; and 4 water storage tanks approximately 150 meters long by 150 meters wide by 33 meters high; and 80 grain-storage silos. The facility would not discharge any material directly to the soil of the immediate area. Some of the air emissions from the facility may deposit on local soils, but that deposition would result in only a minor impact to local areas because of the air dispersion characteristics of the area (see Section VI of the permit analysis and Section 8.F of this EA).

The city annexation portions of this project would result in very little impact on the geology and soil quality, stability, and moisture because the activities would result in minimal disturbance to land/water and the disturbances would be temporary in those areas that are not already disturbed. The sewer and water system upgrade would require the use of motor vehicles, but again, the impacts would be minor and of a short time duration.

D. Vegetation Cover, Quantity, and Quality

The proposed project would result in minor impacts on the vegetative cover, quantity, and quality in the immediate area because a relatively small amount of land would be disturbed and the resulting deposition from air emissions would be relatively small (see Section VI of the permit analysis and Section 8.F of this EA). The main physical disturbance from the facility would be the building structures described in Section 8.C. However, including the building, approximately 20 acres of land would be impacted by the construction and operation of the facility. In comparison to the surrounding agricultural properties, the disturbance of this acreage would constitute a very small percentage of the vegetative cover in the area. See Section 8.D of this EA.

In addition, as described in Section VI of the permit analysis and Section 8.F of this EA, the modeled air impacts from the air emission from this facility are minor. As a result, the corresponding deposition of the air pollutants on the surrounding vegetation would also be minor.

The annexation portion of the project would have little, if any, impact on the vegetation in the area because the disturbances would occur on previously disturbed land and other relatively small portions of land. Those disturbances to previously disturbed land would be of short duration and would eventually return to their current status. Of those impacts to new areas, the amount of vegetation disturbed for the annexation process would be small. Furthermore, most of the newly disturbed areas would recover to their current status after installation of the appropriate utilities. Overall, any impacts to vegetation cover, quantity, and quality would be minor.

E. Aesthetics

The impacts to the aesthetics of the area from the project would be minor because the proposed area of operation is in the process of transition from a mostly agricultural area to an industrial park with MFMP already permitted for construction and operation within the proposed area. In addition, other existing industrial and commercial facilities/structures are located in the nearby area. Further, the facility would not be highly visible (if at all) from gathering places along the Missouri River, and the noise from the facility would be low. While the facility would be located on a bench above the city of Great Falls and various gathering locations along the Missouri River, a pre-assessment site visit by Department staff indicated that the site is not significantly visible from the city of Great Falls or from the various recreational sites along the Missouri River on it's course through Great Falls. The facility would consist of 80 grain-storage silos; a headhouse, approximately 400 meters long by 25 meters wide by 33 meters high; 4 germination vessels; 3 kiln vessels; and 4 water storage tanks, approximately 150 meters long by 150 meters wide by 33 meters high.

The IMC facility would be visible from Highway 87 (approximately 1 mile away) and may be partially visible from the Lewis and Clark Interpretive Center (approximately 1.8 miles away) and Giant Springs Heritage State Park (approximately 1.9 miles away). Based on the extent that the radio/television towers around Black Eagle Road are visible from the Lewis and Clark Interpretive Center, it appears that the grain-storage silos and the germination vessels at the IMC facility may be partially visible. When compared to the other structures visible from the Lewis and Clark Interpretive Center, such as the radio/television towers, a water tank, residential houses, and electrical substations, the IMC facility would have minor visible aesthetic impacts because only a portion of the proposed facility would likely be visible. In addition to the building structures described, steam plumes would be visible from the facility on those days with temperatures low enough to cause steam plumes to form. This impact would be minor because on these days there are numerous other steam plumes visible from other industrial facilities, automobiles, residential homes, etc., in the proposed area of operation.

Another aesthetic attribute of the area is the Upper Missouri River Breaks National Monument. According to the Bureau of Land Management's web-site, the center of this monument is the 149-mile long Upper Missouri National Wild and Scenic River. The Upper Missouri River begins at historic Fort Benton, Montana, on U.S. Highway 87 and ends 149 miles downstream where the Fred Robinson Bridge on U.S. Highway 191 crosses the Missouri River. Fort Benton is approximately 36 miles from the site location of the proposed IMC facility. The IMC project would not affect any aesthetic attribute of the Upper Missouri River Breaks National Monument.

The predominant use of the land at the proposed site is currently used for agricultural purposes; however, other industry currently operates in the surrounding area. Further, as previously stated, MFMP is permitted to locate at a site directly adjacent to the proposed IMC facility location, MRC is located approximately 2 miles away, Agri-Tech is permitted to locate at a site approximately 3.8 miles away, MAFB is located approximately 4 miles away, numerous radio/television towers are nearby, and a bus "yard" is also located in the general area proposed for the facility.

The facility would result in additional noise for the area. The noise impacts from this facility on the surrounding area would be minor because the noise from the facility is relatively quiet when compared to other common area noise sources. The distance to the nearest residence is approximately ¼ to ½ mile away and since noise impacts are minimized by distance, the proposed facility location would further minimize the aesthetic noise impacts from the proposed facility.

There would be a minor increase in odors from the proposed facility because, as the malt is dried and roasted, a mild nutty aroma is perceptible. Currently, odors from the existing MRC refinery are noticeable throughout the Great Falls area, including the proposed area of operation. Thus, any impacts from additional odors from the IMC facility would be minor in comparison to other existing industrial odors present in the area.

The area would also receive increased vehicle use as a result of the proposed project; however, the Department does not believe that the amount of vehicle trips in the area would increase substantially over the existing traffic in the area. The vehicles would likely use the existing roads in the area en route to the roads established as part of the actual proposed facility. Visible emissions (whether the county's responsibility or IMC's responsibility) would be limited to 20% opacity. Further, an existing rail-line located near the proposed facility location would be extended approximately 4 miles to service the IMC facility. Because rail traffic is currently a normal attribute of the area the proposed rail line extension would result in only minor additional impact associated with rail traffic. Overall any impacts to the aesthetic nature of the area would be minor.

F. Air Quality

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment (Criteria Pollutants: CO, NO_x, Ozone, Lead, PM_{10}, SO_x). The Clean Air Act established two types of NAAQS, Primary and Secondary. Primary Standards are limits set to protect public health, including, but not limited to, the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary Standards are limits set to protect public welfare, including, but not limited to, protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Primary and Secondary Standards are identical with the exception of Sulfur Dioxide which has a less stringent Secondary Standard. The air quality classification for Great Falls is "Unclassifiable or Better than National Standards" (40 CFR 81.327) for all pollutants. As described in Section V of the permit analysis, a narrow area along 10^{th} Avenue South was previously classified as a non-attainment area for CO but has since been re-designated as attainment under a limited maintenance plan (LMP). This re-designation became effective on July 8, 2002.

The maximum estimated emissions from the proposed IMC facility would be approximately 123.8 tons per year (tpy) of NO_x, 103.6 tpy of CO, 73.3 tpy of PM_{10}, 6.3 tpy of volatile organic compounds (VOCs), and 90.8 tpy of SO_2. IMC submitted air dispersion modeling to demonstrate compliance with the NAAQS and Montana Ambient Air Quality Standards (MAAQS) and the Class II PSD increments for SO_2, NO_x, and PM_{10}. IMC was not required to demonstrate compliance with the SO_2 MAAQS for all existing sources because nearby MRC does not show compliance with the MAAQS and, as an existing source, is exempt from this demonstration requirement. The minor source baseline dates for NO_x, PM_{10}, and SO_2 have also been established in the area so a Class II increment analysis was required and performed. In addition, due to a recent increase in industrial development in the proposed area, the Department requested IMC perform a Class I NO_x Increment analysis.

The ISC-PRIME model was used along with 5 years of meteorological data (1987-1991) collected at the Great Falls International Airport - National Weather Station. Building downwash effects from the facility were calculated using the EPA developed Building Profile Input Program for use with the ISC-PRIME (BPIP-PRIME). The receptor grid elevations were derived from digital elevation model (DEM) files using the United States Geological Survey (USGS) 7.5-minute series (1:24,000 scale) digitized topographical maps. The receptors were placed at 50-meter intervals along the property boundaries, 100-meter intervals from the property boundaries to 1 kilometer, 250-meter intervals from 1 to 5 kilometers, and at 500-meter intervals from 5 to 8 kilometers. In addition, receptors were placed randomly along the Class I boundaries of the Gates of the Mountains Wilderness; Scapegoat Wilderness; Bob Marshall Wilderness; UL Bend Wilderness, and Glacier National Park, for the PSD Class I increment compliance demonstration.

Table 1 identifies the design concentrations and modeling parameters entered into the model for the IMC facility.

Table 1. Source Physical Parameters and Emission Rates

Source ID	Easting (X) (m)	Northing (Y) (m)	Stack Height (ft)	Temp (°F)	Exit Velocity (ft/s)	Stack Diameter (ft)	CO (lb/hr)	NOX (lb/hr)	PM (lb/hr)	SO2 1-3 Hr (lb/hr)	SO2 24hr & Annual (lb/hr)	VOC (lb/hr)
BF01	480383.6	5265614	90	68	132.6	2	0	0	1.07	0	0	0
BF02	480375.9	5265614	90	68	132.6	2	0	0	1.07	0	0	0
BF03	480366.7	5265614	90	68	132.6	2	0	0	1.07	0	0	0
BF04	480376.7	5265579	180	68	94.3	1.5	0	0	0.43	0	0	0
BF05	480372.2	5265579	180	68	118.8	2.5	0	0	1.5	0	0	0
BF06	480381.1	5265579	180	68	132.6	2	0	0	1.07	0	0	0
BF07	480382.6	5265601	65	68	118.8	2.5	0	0	1.5	0	0	0
BF08	480382.6	5265595	65	68	118.8	2.5	0	0	1.5	0	0	0
SV3	480334.9	5265537	65	131	118.9	2	6.27	7.5	0.54	0.08	0.08	0.38
SV4	480297	5265539	65	131	118.9	2	6.27	7.5	0.54	0.08	0.08	0.38
SV5	480248.7	5265554	65	131	118.9	2	6.27	7.5	0.54	0.08	0.08	0.38
SV10	480240.4	5265529	150	600.01	75.3	1.8	4.84	5.78	0.41	0.06	0.06	0.3
KLN1	480321.2	5265551	42	100	80.2	15.6	0	0	0.6	83.3	10.42	0
KLN2	480281	5265551	42	100	80.2	15.6	0	0	0.6	83.3	10.42	0
KLN3	480240	5265551	42	100	80.2	15.6	0	0	0.6	83.3	10.42	0
Volume Sources												
Source Description	Source ID	Release Ht (m)	σy (m)	σy (m)	----------							
Grain Receiving & Loadout Spouts	LOADR CV1	15	4.0	4.0	----------							
	LOADR CV2	15	4.0	4.0	----------							
Truck Traffic[a]	HRD_* **	3.5	14.0	1.3	Truck Traffic contains 24 individual Sources							

PM_{10}, NO_2, and SO_2 emissions exceeded the modeling significance levels; thus, additional modeling was necessary to demonstrate compliance with the NAAQS, MAAQS, and applicable PSD increments. The largest identified radius for determining the significant impact area for the project was the 3-hour SO_2 averaging period, which extended 11.9 kilometers. CO was below the modeling significance, so no additional modeling was conducted for CO emissions. The NAAQS/MAAQS demonstration and PSD Class I/II analyses were performed including the following sources: MRC, MAFB, Agri-Tech, and MFMP. The NAAQS/MAAQS analyses for NO_x, SO_2, and PM_{10} were conducted using the potential emissions from IMC, MRC, MAFB, Agri-Tech, and MFMP. The results of the NAAQS/MAAQS analysis are summarized in Table 2 below.

Table 2. NAAQS/MAAQS Ambient Modeling Results

Pollutant	Avg. Period	Modeled Conc. ($\mu g/m^3$)	Background Conc. ($\mu g/m^3$)	Ambient Conc. ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	% of NAAQS	MAAQS ($\mu g/m^3$)	% of MAAQS
PM_{10}	24-hr	27.5	61	88.5	150	59	150	59
	Annual	10.7	21	31.7	50	63.4	50	63.4
NO_2	1-hr	306.9	75	381.9	------	------	564	67.7
	Annual [a]	33.6	6	39.6	100	39.6	94	35.7
SO_2	1-hr	1266.2	35	1301.2	------	------	1,300	>100
	3-hr	1266.2	26	1292.2	1,300	99.4	------	NA
	24-hr	344.0	11	355	365	97.2	365	NA
	Annual	76.7	3	79.7	80	99.6	52	NA

[a] Neither the Ozone Limiting Method or Ambient Ratio Method were applied to these results.

Note that the SO_2 MAAQS are exceeded, which is a result of MRC's SO_2 emissions. MRC is an existing source (i.e. grand-fathered source) and is not required to demonstrate compliance with the MAAQS. MRC currently has a permit with SO_2 limits to demonstrate compliance with the NAAQS. However, IMC demonstrated compliance with the MAAQS on an individual basis.

The results for the Class I and Class II demonstrations for NO_x are summarized in Table 3. PM_{10} and SO_2 Class I Increment were not required because this facility is not a PSD source. The NO_2 increment was conducted at the Department's request as a result of the recent increase in the industrial development of the proposed area.

Table 3. Class I and II Modeling Results

Pollutant	Avg. Period	Class II Modeled Conc. ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)	% Class II Increment Consumed	Class I Modeled Conc. ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)	% Class II Increment Consumed
PM_{10}	24-hr	27.5	30	91.7	----	8	----
	Annual	10.7	17	62.9	----	4	----
SO_2	3-hr	476	512	92.9	----	25	----
	24-hr	39.9	91	43.8	----	5	----
	Annual	12.9	20	64.5	----	2	----
NOx	Annual[a]	23	25	92.0	0.006	2.5	0.2

[a] The modeled concentration was 30.58 $\mu g/m^3$ (30.058 * 0.75 = 23.0 $\mu g/m^3$).

The Ambient Ratio Method and the Ozone Limiting Method were not applied to the modeled NO_x emissions to convert the modeled concentrations to NO_2 for comparison with the NAAQS/MAAQS. Therefore, these results may be considered conservative for the NAAQS/MAAQS demonstration. However, the Ambient Ratio Method was used to convert the modeled NO_x concentration to NO_2 for comparison against the Class II increment. The reported values include the highest modeled concentrations for both the combined and simple cycle scenarios proposed for the previously permitted MFMP facility.

As shown in the previously-discussed modeling demonstration, impacts from the proposed IMC project would not contribute to a violation of the MAAQS/NAAQS and/or the PSD Class I/II increment. Therefore, any impacts to the air quality in the proposed area of operation would be minor and would maintain compliance with all applicable standards.

G. Unique Endangered, Fragile, or Limited Environmental Resources

To identify any species of special concern in the immediate area of the proposed project, the Department contacted the Montana Natural Heritage Program of the Natural Resource Information System (NRIS). The Natural Heritage Program files identified two species of special concern in the area. Area in this case includes the Section, Township, and Range where the proposed facility would locate with an additional 1-mile buffer. The two plant species identified were the *entosthodon rubiginosus* and the *funaria americana*. Both of these species are found on or near the Missouri River. The search results indicated that both of these plant species were previously recorded within a 5-mile radius (approximately 2 miles). The 5-mile radius does include a small portion of the Missouri River. Therefore, no species of special concern were identified within the proposed area as defined by NRIS.

Based on the modeled air quality impacts from the IMC facility (see Section VI of the permit analysis and Section 8.F of this EA), the IMC proposal would have little, if any, chance of impacting the unique endangered, fragile, or limited environmental resources located in or near the proposed area. The modeling analysis results indicate that the highest impacts from the air emissions from this facility would be minor. Furthermore, the plant species of special concern identified above are not located in the area with the highest impact. Due to the plume characteristics from the proposed facility, the emissions would predominantly be carried to the north and east of the facility, away from the location of these plant species of special concern. Overall, any impact to unique endangered, fragile, or limited environmental resources in the area would be minor.

H. Demands on Environmental Resource of Water, Air and Energy

As described in Section 8.B of this EA, impacts to any water resources in the area would be minor because the facility is largely a non-water consumptive facility; thus, the resulting amount of waste water would be small. Furthermore, IMC is not proposing to directly discharge any material to the surface or ground water in the area.

As described in Section 8.F of this EA, any impact on the air resource in the area would be minor because the dispersion characteristics of the facility and the overall area are good. Ambient air modeling for NO_x, PM_{10}, and SO_2 was conducted for the facility at "worst case" conditions that demonstrates that the emissions from the proposed facility would not exceed applicable ambient air quality standards or PSD Class I increment for NO_x and PSD Class II increment for NO_x, PM_{10}, and SO_x. As a result of the ambient air quality analysis presented in Section 8.F of the EA, Permit #3238-00 would contain conditions limiting the emissions from the facility. Further, as described in Section III of the permit analysis, IMC would be required to apply BACT to operations, as applicable, resulting in less impact to air resources in the proposed area of operations.

The impacts to the energy resource from this facility would be minor because the facility would consume relatively small amounts of natural gas in comparison to other natural gas consuming sources nationally.

The city annexation (sewer and water) portion of this project would result in very little air quality impact because no major air emission activities would be required. The sewer and water system upgrade would likely require the use of motor vehicles, but the impacts would be minor and of a short time duration. Similarly, minor fugitive dust emissions would result from the sewer and water system upgrade; however, these emissions would be minor and temporary.

Further, the proposed facility would not directly discharge any material to the surface or ground water in the area. Also, the proposed demands for potable water to provide services to facility employees and non-process water use requirements would be acquired through the existing City of Great Falls water systems while total facility discharge requirements would be annexed into the existing City of Great Falls water sewage systems.

The water requirements for the barley malting plant operations would likely be met mostly from Giant Springs with additional water potentially acquired form the city of Great Falls, the Great Falls water treatment facility, and recycled water from facility operations. The Giant Springs are natural water springs that would be accessible from the proposed location of the malt plant. The Giant Springs have a flow rate of approximately 194 million gallons per day; thus, at the proposed 2 million gallons per day water use level, the water requirements of the barley malting plant would represent only a minor portion of the existing water flow capacity of this resource, should this source provide the majority of the water needed for operations. Currently, FWP holds rights to 16 million gallons of water per day from the Giant Springs, little of which is actually used by FWP. Through FWP, IMC has arranged for the use of approximately 2 million gallons per day of the FWP allotted 16 million gallons per day allotment from the Giant Springs. In addition, while the proposed project would require a large quantity of water for normal operations, the consumptive portion of the water demands would be relatively minor. Overall, any demand/impact to water resources in the proposed area of operations would be minor.

I. Historical and Archaeological Sites

The impacts on historical and archaeological sites would be minor because, as was evident during the Department's pre-assessment site visit, the site location contained no visible standing structures, the facility would physically impact a small amount of property (approximately 20 acres), the facility would locate within an area that has been plowed for agricultural purposes, and the site location is in an area that would likely not have been used for any significant historical or archaeological activity. The lack of standing structures indicates a lack of historical activity within the proposed site location. Since the topsoil in the area is 4-6 inches thick and covers glacial gravel, any possibility of historical or archaeological material being present would have been destroyed by the agricultural activities (plowing) in the area.

The physical location of the site also indicates that it was not likely a location for significant historical or archaeological activity. The site location would be located in rolling terrain on a bench above the Missouri River and the city of Great Falls. The nearest portion of the Missouri River to the site location is approximately 1.5 miles away, and the bluff is approximately 1.25 miles away from the proposed site location.

As part of the EA process for permitting the Northwestern Energy – Montana First Megawatts, LLC, project (recently permitted at a site directly adjacent to the proposed IMC facility location), the Department contacted the Montana Historical Society – State Historic Preservation Office (SHPO) in an effort to identify any historical or archaeological sites or findings near the proposed project. SHPO's records indicate that there are currently no previously recorded cultural properties within the project site. Because of the fact that severe agricultural activities have occurred in the area, it is unlikely that any undiscovered or unrecorded historical properties exist in the area.

In an effort to expand the cultural resource inventories available in the state, SHPO recommended that a cultural resource inventory be conducted prior to the construction of the Northwestern Montana First Megawatts, LLC, facility. SHPO did not identify that they had concern that historical or archaeological sites are present on the site. In fact, numerous other structures have been constructed in the immediate area of the facility with no identification of historical or archaeological artifacts to SHPO. Neither the Department nor SHPO has the authority to require a cultural resource inventory for this project.

The city annexation (sewer and water) portion of this project would result in no impact on historical or archaeological sites because the disturbances would occur within previously disturbed sites, and the sites that are not previously disturbed would be in the same area as previously described in this section.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological resources of the human environment in the area affected by the current permit application would be minor because the overall air impact from the proposed IMC facility in addition to the other Great Falls industrial sources is minor, the highest impacts from each of the other nearby industrial sources (Northwestern Energy – Montana First Megawatts, LLC, Montana Refining Company, Malmstrom Air Force Base, and Agri-Technology Corporation) does not occur at the same receptor, and the pollutant of concern for each of the nearby industries is generally different. In addition, emissions from the nearby sources that were previously mentioned were included in the NO_x Class II and Class I PSD increment modeling performed by IMC at the request of the Department. The modeling analysis indicated that the cumulative emissions from these facilities would not violate applicable Class I/II PSD increments or any NAAQS/MAAQS.

9. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores			X			Yes
B	Cultural Uniqueness and Diversity			X			Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production			X			Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities			X			Yes
G	Quantity and Distribution of Employment			X			Yes
H	Distribution of Population			X			Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals			X			Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECENOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores
B. Cultural Uniqueness and Diversity

The proposed facility would not impact the above-cited economic and social resources of the human environment in the proposed area of operation because the land use proposal would not be out of place given the current land use of the larger area surrounding the proposed site, the fact that the area has recently seen a large increase in potential industrial development, and the fact that the large majority of the immediate surrounding area is currently and would remain agricultural. The addition of the IMC facility would be consistent with the current use of the larger area surrounding the facility. Besides the agricultural properties near the facility, there are other existing industrial sources, such as Montana Refining Company and Malmstrom Air Force Base in the area and other proposed industrial projects are permitted in the area including Agri-Technology Corporation and Northwestern Energy – Montana First Megawatts, LLC.

In addition, after initial construction, the proposed project would result in approximately 35-40 full time positions with the company. Therefore, considering the population of Great Falls and the surrounding area, operation of the plant would not result in a significant migration of workers or their families to the area.

The other portion of the project (annexation of the facility) would have no impact on social structures and mores because these associated activities are not new to Montana or the specific areas of impact. Most of the impacts from the other portions of the project would occur within previously disturbed sites that are already conducting the desired activity, but may need improvements or upgrades. Overall, any impacts to the above cited economic and social resources of the human environment in the proposed area of operation would be consistent with existing impacts and minor.

C. Local and State Tax Base and Tax Revenue

The facility would have a minor impact on the local and state tax base and tax revenue because, when completed, the facility would employ approximately 35-40 full time employees collectively earning approximately $2.3 million dollars per year in taxable wages, would generate significant property taxes to the area, would generate taxes for an extended period of time (length of malt plant existence), and would employ numerous people (taxpayers) during construction activities. The facility construction cost was estimated to be between $52 and $72 million. In addition, according to an article in the *Great Falls Tribune* dated March 26, 2003, the proposed plant would result in only a minor increase (approximately $30,000) into the city of Great Falls property tax coffers. This minor amount is due to recent legislation lowering potential property taxes to malting facilities for the purpose of providing incentive for malting companies to locate in the area.

The IMC project would be privately funded. However, according to the above-cited *Great Falls Tribune* article, the city water project portion of the proposed plant would be financed through State Block Grants and the city water fund (approximately $511,000). Also, the Board of Investments and IMC would pay approximately $939,000 for the infrastructure needed to pipe the Giant Springs water under the Missouri River and to the proposed facility site. In addition, a $3 million sewer project, proposed for the service of the entire new industrial park area where the IMC facility would locate, would be partially funded by IMC, with other funding sources yet to be determined. Given the current status of the local Great Falls and overall State of Montana tax base and tax revenue, the proposed project would result in a minor impact to current levels.

D. Agricultural or Industrial Production

The impacts to agricultural and industrial production in the area from this facility would be minor because the facility would physically impact a relatively small amount of land currently used for agricultural purposes (20 acres or less), the impact from the air emissions on the land would be minor (see Section VI of the permit analysis and Section 8.F of this EA), and the malt product produced at the plant would likely not undergo further industrial processing in the area. The plant operations would also likely result in a minor and beneficial impact on agricultural (barley) production in the area to facilitate the malt production at the facility.

The other portion of the project (annexation of the facility) would have little, if any impact on agricultural production because the disturbance for most of the activities would be within previously disturbed locations and the disturbances at other locations (addition of utilities during annexation) would be minor and not change the predominant setting and land use of the area. Overall, any impact to local agricultural or industrial production would be minor.

E. Human Health

As described in Section VI of the permit analysis and Section 8.F of this EA, the impacts from this facility on human health would be minor because the impact from the air emissions would be greatly dispersed before reaching an elevation where humans were exposed. Also, as described in these sections, the modeled impacts from this facility, taking into account other dispersion characteristics (wind speed, wind direction, atmospheric stability, stack height, stack temperature, etc.), are low and are well below the MAAQS and the NAAQS, which are designed to be protective of human health.

Besides the criteria pollutants, impacts from all other air pollutants (i.e. Hazardous Air Pollutants (HAPs)) would also be greatly minimized by the dispersion characteristics of the facility and the area (wind speed, wind direction, atmospheric stability, stack temperature, facility emissions, etc.). Impacts from other common activities (such as fueling a vehicle for example) would likely have a greater impact on human health resulting from HAP emissions because of the concentrations at the point of exposure. The air quality permit for this facility would incorporate conditions to ensure that the facility would be operated in compliance with all applicable rules and standards. Again, these rules and standards are designed to be protective of human health. Overall, any impacts to human health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The facility would result in a minor impact on the access to and quality of recreational and wilderness activities because the air emissions from the facility are relatively small and would disperse before impacting any recreational areas (see Section VI of the permit analysis and Section 8.F of this EA), the predominant location of recreational activities in the area (Missouri River) is approximately 1½ to 2 miles away, and most of the nearby recreational activities are upwind of the prevailing wind pattern. Furthermore, no significant recreational or wilderness activities currently exist within the IMC property boundaries.

Recreational activities exist in the area surrounding the proposed site location. The closest recreational opportunities appear to be the Anaconda Hills Golf Course (closest point approximately 0.7 miles), the Rivers Edge Trail (closest point approximately 1.4 miles), Giant Springs Heritage State Park (approximately 1.9 miles), the Missouri River (closest point approximately 1.4 miles), the North Shore Conservation Easement Lands, Black Eagle Dam, Rainbow Dam, Cochrane Dam, Ryan Dam, and Morony Dam. Based on the modeling analysis performed for the IMC project (see Section VI of the permit analysis and Section 8.F of this EA) and the distance between and direction from the recreational sites and the IMC project site, the impacts to the previously mentioned recreational opportunities and other potential recreational opportunities in the area would be minor, if any at all.

Further, the air quality of the Upper Missouri River Breaks National Monument is a potential concern stemming from potential impacts resulting from IMC operations. According to the Bureau of Land Management's web-site, the center of this monument is the 149-mile long Upper Missouri National Wild and Scenic River. The Upper Missouri River begins at historic Fort Benton, Montana, on U.S. Highway 87 and ends 149 miles downstream, where the Fred Robinson Bridge on U.S. Highway 191 crosses the Missouri River. Fort Benton is approximately 36 miles from the site location of the proposed IMC power plant and the remainder of the Wild and Scenic River monument would be located further from the proposed IMC site as it progresses down-river from Fort Benton. The IMC project would not affect the Upper Missouri River Breaks National Monument.

The annexation of the facility would have no impact on recreational and wilderness activities because the areas of disturbance are currently not sites for these types of activities and because most of the impacts would be temporary. Overall, any impact from the proposed IMC facility on any access to and quality of recreational and wilderness activities in the area would be minor.

G. Quantity and Distribution of Employment

There would be a minor effect on the employment of the area from this project because it would result in numerous construction-related employment opportunities and approximately 35-40 full-time positions once the IMC facility is in full operation.

A few temporary employment opportunities would result from the other portion of the project (annexation of the facility). The sewer and water system upgrades would require some construction and corresponding man-hours. However, the impacts on quantity and distribution of employment would be minor because the required work would be temporary and would likely be handled by current employees of the City of Great Falls. Overall, any impact to the quantity and distribution of employment in the Great Falls area would be minor.

H. Distribution of Population

The entire project would not affect the normal population distribution in the area because, excluding the approximate 35-40 full-time positions that would result from plant operations, the remainder of the jobs created from this project would be temporary. Neither the full-time positions nor the numerous temporary construction-related positions would likely affect the distribution of population in the area.

Most employees required for the construction and operation of the power plant would likely be from Great Falls or the surrounding area or temporarily locate within Great Falls since housing would be easier to locate. For the other construction related activities with this project, employees would likely be existing staff in the area and would likely not migrate to Great Falls for any extended period of time. Overall, any impact to the distribution of population in the area would be minor and predominantly short-lived.

I. Demands for Government Services

Demands on government services from this facility would be minor because minor increases may be seen in traffic on existing roads in the area while the facility is operating and under construction. However, since the facility would be annexed into the City of Great Falls as part of the project, other improvements by the City of Great Falls may be required. Only a small portion of water for the facility may be obtained from the Great Falls municipal water supply (majority of process water would likely come from Giant Springs), and all spent water would be discharged to the Great Falls city sewer.

The acquisition of the appropriate permits by the facility, the permits for the associated activities of the project, and compliance verification with those permits would also require minor services from the government.

J. Industrial and Commercial Activity

The IMC facility would represent a minor increase in industrial activity in the area. The facility would operate 24 hours a day and 7 days per week for the production of malt and salable malt by-product from barley grain. Further, the malt product produced would likely not undergo further processing in the area thereby minimizing industrial impact. Overall, the facility would result in minor impacts to the predominantly industrial/agricultural character of the Great Falls area.

K. Locally Adopted Environmental Plans and Goals

Prior to July 8, 2002, the City of Great Falls contained a nonattainment area for CO along the 10th Avenue South corridor. On this date the U.S. Environmental Protection agency approved a CO "attainment" limited maintenance plan (LMP) for the area, citing that the area is in compliance with ambient CO standards. The proposed facility is outside of the CO LMP area and would result in only minor impacts to the area because the CO emissions from the facility have been modeled to demonstrate that the impacts would not significantly contribute to any further CO attainment status problems in the CO LMP area (see Section VI of the permit analysis and Section 8.F of this EA). In addition, the modeling inputs were based on the "worst case" CO emissions from the facility. Not only would the facility seldom operate at "worst case" conditions, but the prevailing wind pattern in the area would carry the emissions from the facility to the north and east of the plant, away from the CO LMP area. Overall, the proposed project could result in minor impacts to the local CO attainment LMP area.

The Department is unaware of any other locally adopted environmental plans and goals that would be affected by the facility or the other portions of the project as identified at the beginning of this EA. The state standards would be protective of the environment.

L. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the social and economic resources of the human environment would be minor because 35-40 new full-time employment opportunities would result and many additional and temporary construction related employment opportunities would be available.

The IMC project would result in additional jobs for the Great Falls area. As described in Section 9.G of this EA, the facility would employ new full-time positions and temporary employment during the construction phase of the project. The "day-to-day" normal operation positions and the construction-related positions created by the IMC project would bring additional money into the Great Falls economy. In addition, changes to infrastructure (i.e. roads) and increased traffic would result from the proposed project but would create only minor impacts because these changes would represent only a small increase in the existing impacts created by these types of activities. Overall, any impact to the social and economic resources of the human environment in the Great Falls and surrounding area would be minor.

Recommendation: No EIS is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the construction and operation of a barley malt manufacturing plant. Permit #3238-00 includes conditions and limitations to ensure the facility would operate in compliance with all applicable rules and regulations. In addition, as discussed in the above EA, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program.

Individuals or groups contributing to this EA: Department of Environmental Quality – Air and Waste management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program.

EA prepared by: M. Eric Merchant, MPH
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